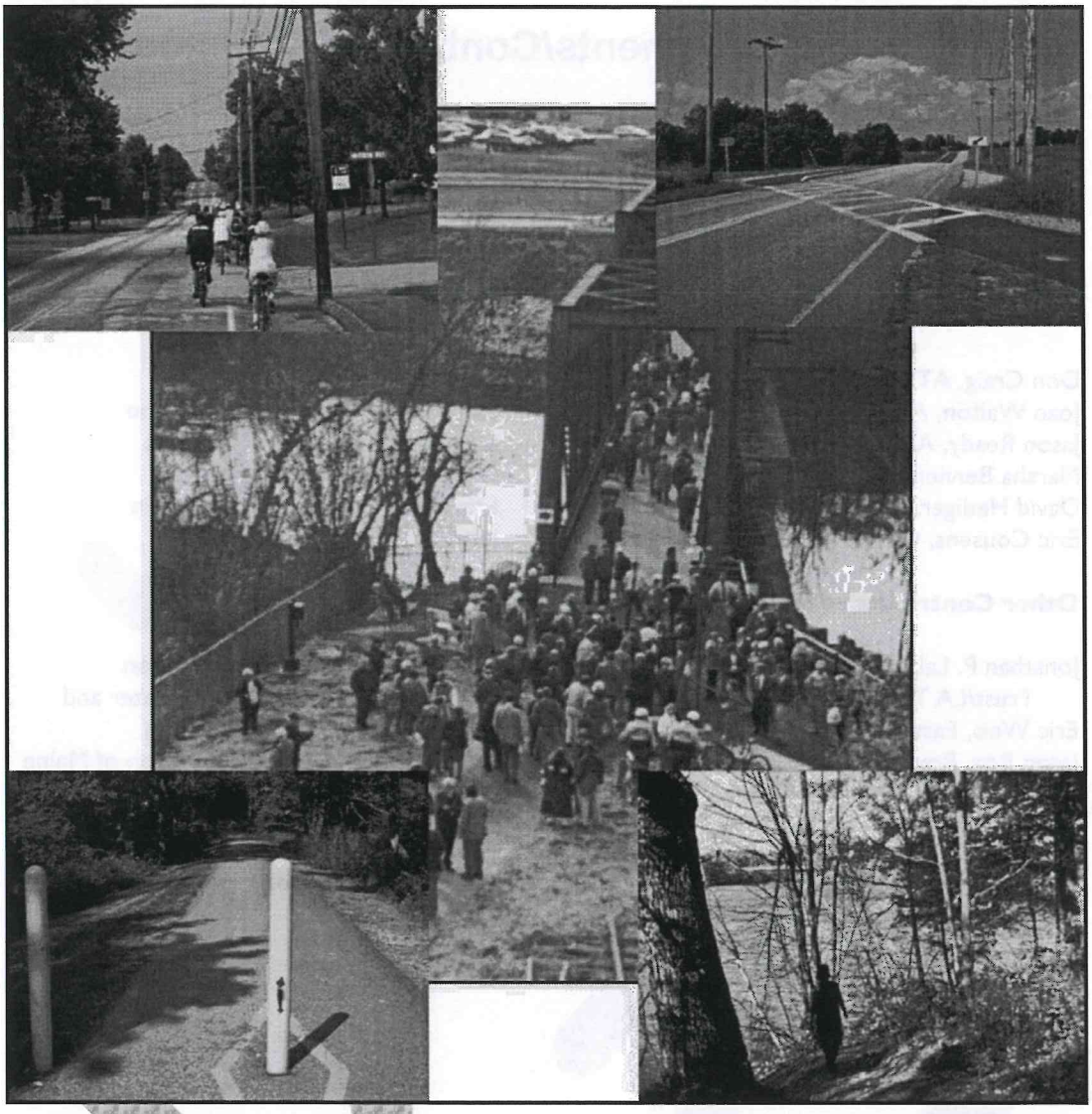


# BRIDGING THE GAPS
## A Long-Range Facilities Plan for Bicycling and Walking in the ATRC Region: Lewiston/Auburn/Lisbon/Sabattus


Updated by:

Androscoggin Transportation Resource Center

Gorrill-Palmer Consulting Engineers, Inc.



Draft Report – October 2008

# Acknowledgements/Contact Information

This update has been made possible by the contributions of a number of individuals and groups, including the members of the Project Committee. In addition to the members of the Committee, input was received from a number of stakeholder groups. Without their efforts, this Update would not have been possible.

**ATRC Bicycle Pedestrian Plan Update Committee**

Don Craig, ATRC
Joan Walton, ATRC
Jason Ready, ATRC
Marsha Bennett, ATRC
David Hediger, City of Lewiston
Eric Cousens, City of Auburn
Ryan Leighton, Town of Lisbon
Stephen Eldridge, Town of Lisbon
Steve LeBrun, Town of Sabattus
Gregory Gill, Town of Sabattus
Erin Guay, Healthy Androscoggin
John Grenier, Rainbow Bicycle

**Other Contributors/Stakeholders**

Jonathan P. Labonté, Androscoggin Land Trust/LA Trails
Eric Weis, East Coast Greenway
Jason Roy, Roy's Bicycle Shop
Alyson Stone, Empower Lewiston
Normand R. Lamie, Auburn Water and Sewerage District
Maggie Warren, Bicycle Coalition of Maine

For more information about the bicycle and pedestrian plan, please contact Joan Walton, Planner, Androscoggin Transportation Resource Center, 125 Manley Road, Auburn, Maine 04210. Tel: 207.783.9186 or e-mail jwalton@avcog.org.

# Table of Contents

# Executive Summary

***Introduction***

For decades now, Lewiston, Auburn, Lisbon and Sabattus have committed the vast majority of their transportation funding to the promotion of the private automobile. This has allowed for continued economic growth and development. However, it is also clear that it is also important to support long-term investments that will make bicycling and walking a viable and attractive choice of travel.

These choices are of critical importance to many residents in Lewiston, Auburn, Lisbon and Sabattus, as many residents (over one third in the 2000 Census) do not have an option to drive. In parts of downtown Lewiston-Auburn in particular, as many as fifty percent of households do not own a car. The downtown areas of these communities, built before the automobile, possess a number of assets that facilitate bicycling and walking. According to the 2000 Census, about half of Lewiston-Auburn's residents live within a two-mile radius of downtown - a reasonable distance for walking and bicycling to the Bates Mill or Great Falls Plaza. Indeed, most of the area's attractions, including its schools, malls, mills, colleges, businesses, hospitals, movie theaters, and parks are within two miles of downtown. For many of these trips, the Androscoggin River will provide a scenic travel corridor for getting around by foot or by bike.

Public officials and residents alike have already consistently voiced support for physical improvements to the region's bicycling and walking network. Based on a survey completed by Healthy Androscoggin, an organization that, among other tasks, promotes exercise for Androscoggin-area residents, additional pedestrian and bicycle facilities are in high demand. The survey identified that greater opportunities for pedestrians as well as connections to recreational facilities are important to area residents, as well as developments of all kinds in the downtown and riverfront areas in the municipalities surveyed.

On a positive note, it appears that the corner may have been turned on a decline in pedestrian and bicycle safety as well as the provision of facilities in Lewiston, Auburn, Lisbon and Sabattus. All of the municipalities have expressed an interest in upgrading facilities. Lewiston is in the process of providing a trail system along the Androscoggin between Island Point and the Veteran's Memorial Bridge. Auburn has extended its Riverwalk facility north to Court Street, and the Auburn Mall area recently received roadway upgrades that included bicycle lanes and improved pedestrian facilities. Lisbon has been moving aggressively to expand its trail system, including the Paper Mill Trail. And Sabattus has identified numerous locations where future trail and pathway development would be possible.

***Challenges for Bicycling and Walking***

Although they are healthy, affordable, fun, and good for the environment, walking and bicycling face numerous challenges. The National Bicycling and Walking Study conducted by the United States Department of Transportation identifies three primary reasons:

***Distance:*** People live further away from where they want to shop, work, and play. Based on the 2000 Census, from 1990 to 2000, Androscoggin County lost almost 1,500 people but gained over 2,000 housing units, particularly in the once rural towns of Durham, Greene, Minot, Poland, Sabattus, and Turner. Spreading out means longer distances and longer commutes to the store, the office, the park, or the doctor, trips which are increasingly made by car. While both Lewiston and Auburn appear to be on a growth trajectory, the overall trends do not appear to have changed significantly as we look ahead to the 2010 Census. However, with improved connections for those who use a bicycle or travel on foot, the desire to live in downtown areas could increase.

***Safety:*** Historically, shopping centers and subdivisions have been built without adequate access for people arriving by foot or by bike. In many cases, even where these facilities may be internally designed for other modes, connections to the nearby roadway network provide few opportunities for non-motorized traffic. The region's arterial and collector roads, often being a difficult environment for other modes and carrying the vast majority of car and truck traffic, as a result have the majority of pedestrian and bicycle accidents in the Lewiston/Auburn/Lisbon/ Sabattus area. By planning for people as well as for cars, transportation projects and new land-use developments can ensure safer access, mobility, and choice for all residents. And newer transportation improvements, such as the Auburn Mall Master Plan, reflect a desire to accommodate other modes, with sidewalks, visible crosswalks, and designated bicycle lanes.

A review of the crash data revealed that other than the potential for placement of striped shoulders or bicycle lanes, locations with a cluster of bicycle or pedestrian incidents did not have a definable or correctable patterns. However, education of bicyclists, pedestrians, and drivers overall may increase awareness and help to minimize safety risks.

***Attraction:*** Without a doubt, most streets in Lewiston, Auburn, Lisbon and Sabattus are largely oriented to cars. But well-designed corridors are not only safe, they are places to greet neighbors and linger with friends. With Lewiston, Auburn, and Lisbon losing almost eight percent of their population from 1990 to 2000, urban downtowns and villages have become focal points for revitalization. Projects such as Gas Light Park in Lewiston, the Paper Mill/Ricker Trail network in Lisbon and Riverwalk in Auburn all help to attract businesses to locate to southern Androscoggin County, draw visitors and office workers to spend money, and increase the quality of life for all residents.

The Long Range Facilities Plan is intended to serve as a guide to help municipal officials and other community leaders in the Lewiston, Auburn, Lisbon and Sabattus area build a seamless network of bicycle and pedestrian facilities over the next 20 to 25 years. Since the region's first Bicycle and Pedestrian Plan was completed in 1995 and updated in 2002, the Lewiston, Auburn, Lisbon and Sabattus area has utilized several million dollars in state, federal and local resources for the construction of sidewalks, bike lanes, shoulders, and paved pathways. To update the 2002 plan, the Androscoggin Transportation Resource Center (ATRC) launched a project committee and planning process that will mesh with their overall Transportation Plan Update, the guiding document for long-term investments made for roads, highways, transit, rail, freight, air, and bicycling and walking facilities in the ATRC region.

As part of this project, ATRC is publishing a **2030 Vision** for the region's bicycling and walking network. What follows is a discussion of the various components of the Plan to make this Vision a possibility, with the primary emphasis on the Engineering component, including facilities recommendations, funding strategies, and policy objectives, all requiring significant investments.

These investments will not be made all at once. Construction will be incremental. Primary responsibility will rest with each community's elected, planning and public works officials, who have the authority to implement policies that ensure all roads, subdivisions, shopping areas, and other developments include bicycle and pedestrian facilities. Schools, businesses, community groups and other stakeholders will play an important role in designing, building, maintaining, and promoting these facilities, as well as in identifying future routes yet to be discovered. However, this update Plan provides not only various goals for specific facilities, but also provides a certain level of prioritization in order to make clear which projects are considered very important to the four communities adopting the plan.

### *Overview of the Plan/2030 Vision*

*Major Strategies for New Facilities*

The Plan is largely the engineering and policy component of the following broader strategies for a Plan:

- *Education:* Provide information to the Communities comprising the plan as to the options of travel and the need for healthy modes of living.
- *Encouragement:* Promote the use of other modes through the dissemination of mapping and related information, as well as promotion of other modes by employers.
- *Engineering:* Allocate funding for facilities, resulting in the design and construction of new facilities.
- *Enforcement:* Teach safe behaviors in schools and make sure that bicyclists and pedestrians are kept safe from the remainder of the traveling public, while ensuring they conform with correct practices for bicycling and walking.

*Facilities in Plan*

As this Plan focuses primarily on the Engineering Component, the selection and funding of specific facilities comprises most of this report. The report provides discussion and recommendations for the following facilities:

- *Sidewalks:* Facilities separate from roadways designated solely for walkers or wheelchair users
- *Paths (Pedestrian):* Marked and designated walkways for pedestrian use exclusively, typically in undeveloped areas
- *Paths (Multi-Use):* Pathways graded and improved such that pedestrians, bicyclists, and other non-motorized modes may utilize the facility for travel or recreation
- *Bicycle Boulevards:* Roadways designated for shared bicycle and vehicle use, usually with low vehicular speeds and volumes
- *Bicycle Lanes:* A shoulder treatment, at least four feet in width, striped and designated specifically for bicycles
- *Bicycle Routes:* Roadways with some level of designation for bicycles, typically signage and/or inclusion on mapping

*Principles for Selection*

The Plan is based on the following principles for inclusion of specific facilities:

- *Accessibility:* Provides access for high population densities or a critical-need population
- *Safety:* Minimizes conflicts between non-motorized and motorized modes
- *Connectivity:* Provides linkages to and from significant destinations, such as downtowns, and is in close proximity to transit modes, such as the citylink bus service
- *Attractiveness/Usability:* Ideally, a facility will be scenic as well as relatively level, in order to attract the broadest array of users
- *Cost:* A facility should be completed in conjunction with larger projects when applicable, minimize right-of-way impacts, and be based on sound engineering practice

*Mapping*

The facility maps are included in the back of this report, and they include recommendations for paths, multi-use paths, and various bicycle facilities. In addition, significant additional mapping for pedestrian facilities is available through LA Trails at http://www.latrails.org/.

*Funding Strategies*

The Plan recommends a number of funding strategies, including the following:

- *BTIP Funding:* The majority of state and federal funding, allocated on a biannual basis
- *Safe Routes to School:* Funds available from the federal government for walking and biking facilities within two miles of an elementary or middle school
- *Community Development Block Grants:* Federal funds for improvements in downtown areas, which can include transportation facilities
- *Local Transportation Funds:* Funding available based on tax dollars levied for use by a specific municipality, usually determined by the Public Works or Community Services departments
- *Tax Increment Financing Districts:* Use of local tax dollars placed in a separate fund for infrastructure improvements
- *Impact Fees:* Use of a "pay-as-you-go" system where development projects each pay their share toward specific infrastructure improvements

*References for Facility Selection*

The facilities themselves were selected and based on the following:

- The existing mapping provided for the 2002 Plan/2025 Vision
- Interviews with Staff of Rainbow Bicycle & Fitness (Auburn) and Roy's Bicycle Shop (Lewiston)
- Participation/review of other planning efforts, including the 2002 Bicycle and Pedestrian Plan, East Coast Greenway, Androscoggin Land Trust, Empower, Auburn Water and Sewerage District plans, and plans for commercial developments
- Work with community groups, including the Androscoggin Land Trust, LA Trails, Healthy Androscoggin and Empower Lewiston

With these and other recommendations in mind, the hope is that bicycling and walking become an increasingly important part of the overall transportation system in Lewiston, Auburn, Lisbon and Sabattus. The benefits will be less traffic congestion, a healthier public, more options for travelers, and increased opportunity for those without automobiles.

# Chapter 1: Safety Assessment

Prior to the selection of facilities or other recommendations, the overriding issue of importance is to determine the potential safety issues in for Lewiston, Auburn, Lisbon and Sabattus as they relate to bicycles and pedestrians. What follows is an assessment of potential crash issues and any recommendations that come from this assessment.

***Pedestrian Collisions:*** During the period 2005 to 2007, there were 73 incidents involving pedestrians in Auburn, Lewiston, Lisbon and Sabattus. The majority of these were at intersections as opposed to roadway segments. The overall crash information is summarized on the following table:

## Pedestrian Collisions: 2005-2007

| Town Name | Data | Crash Year | | | Grand Total |
|---|---|---|---|---|---|
| | | 2005 | 2006 | 2007 | |
| Auburn | Total Number of Crashes | 3 | 4 | 8 | 15 |
| | Total Fatalities | 1 | 0 | 0 | 1 |
| | Total Incapacitating Injuries | 0 | 1 | 2 | 3 |
| | Total Evident Injuries | 0 | 2 | 3 | 5 |
| | Total Possible Injuries | 2 | 1 | 4 | 7 |
| Lewiston | Total Number of Crashes | 24 | 16 | 15 | 55 |
| | Total Fatalities | 0 | 0 | 1 | 1 |
| | Total Incapacitating Injuries | 5 | 2 | 2 | 9 |
| | Total Evident Injuries | 12 | 10 | 7 | 29 |
| | Total Possible Injuries | 5 | 4 | 5 | 14 |
| Lisbon | Total Number of Crashes | 0 | 1 | 0 | 1 |
| | Total Fatalities | 0 | 1 | 0 | 1 |
| | Total Incapacitating Injuries | 0 | 0 | 0 | 0 |
| | Total Evident Injuries | 0 | 0 | 0 | 0 |
| | Total Possible Injuries | 0 | 0 | 0 | 0 |
| Sabattus | Total Number of Crashes | 0 | 0 | 2 | 2 |
| | Total Fatalities | 0 | 0 | 0 | 0 |
| | Total Incapacitating Injuries | 0 | 0 | 1 | 1 |
| | Total Evident Injuries | 0 | 0 | 1 | 1 |
| | Total Possible Injuries | 0 | 0 | 0 | 0 |
| **Grand Total Number of Crashes** | | **27** | **21** | **25** | **73** |
| **Grand Total Fatalities** | | **1** | **1** | **1** | **3** |
| **Grand Total Incapacitating Injuries** | | **5** | **3** | **5** | **13** |
| **Grand Total Evident Injuries** | | **12** | **12** | **11** | **35** |
| **Grand Total Possible Injuries** | | **7** | **5** | **9** | **21** |

**Source: MaineDOT**

Lewiston experienced the vast majority of collisions, at 75 percent of the total, with Auburn at 21 percent, and Lisbon and Sabattus with a few scattered incidents. Eighteen percent of the collisions, thirteen incidents, resulted in serious injuries to the pedestrians that incapacitated them. Three incidents resulted in pedestrian fatalities, scattered evenly between Auburn, Lewiston and Sabattus.

***Bicycle Collisions:*** During the period 2005 to 2007, there were 41 incidents involving bicyclists in Auburn, Lewiston, Lisbon and Sabattus. Similarly to the pedestrian incidents, the majority of these were at intersections as opposed to roadway segments. The overall crash information is summarized on the following table:

## Bicycle Collisions: 2005-2007

| Town Name | Data | Crash Year 2005 | 2006 | 2007 | Grand Total |
|---|---|---|---|---|---|
| Auburn | Total Number of Crashes | 6 | 1 | 2 | 9 |
| | Total Fatalities | 0 | 0 | 0 | 0 |
| | Total Incapacitating Injuries | 0 | 1 | 1 | 2 |
| | Total Evident Injuries | 2 | 0 | 1 | 3 |
| | Total Possible Injuries | 4 | 0 | 0 | 4 |
| Lewiston | Total Number of Crashes | 7 | 14 | 9 | 30 |
| | Total Fatalities | 0 | 0 | 0 | 0 |
| | Total Incapacitating Injuries | 0 | 1 | 0 | 1 |
| | Total Evident Injuries | 5 | 8 | 4 | 17 |
| | Total Possible Injuries | 2 | 4 | 3 | 9 |
| Lisbon | Total Number of Crashes | 1 | 0 | 0 | 1 |
| | Total Fatalities | 0 | 0 | 0 | 0 |
| | Total Incapacitating Injuries | 0 | 0 | 0 | 0 |
| | Total Evident Injuries | 1 | 0 | 0 | 1 |
| | Total Possible Injuries | 0 | 0 | 0 | 0 |
| Sabattus | Total Number of Crashes | 0 | 1 | 0 | 1 |
| | Total Fatalities | 0 | 0 | 0 | 0 |
| | Total Incapacitating Injuries | 0 | 0 | 0 | 0 |
| | Total Evident Injuries | 0 | 1 | 0 | 1 |
| | Total Possible Injuries | 0 | 0 | 0 | 0 |
| **Grand Total Number of Crashes** | | **14** | **16** | **11** | **41** |
| **Grand Total Fatalities** | | **0** | **0** | **0** | **0** |
| **Grand Total Incapacitating Injuries** | | **0** | **2** | **1** | **3** |
| **Grand Total Evident Injuries** | | **8** | **9** | **5** | **22** |
| **Grand Total Possible Injuries** | | **6** | **4** | **3** | **13** |

**Source: MaineDOT**

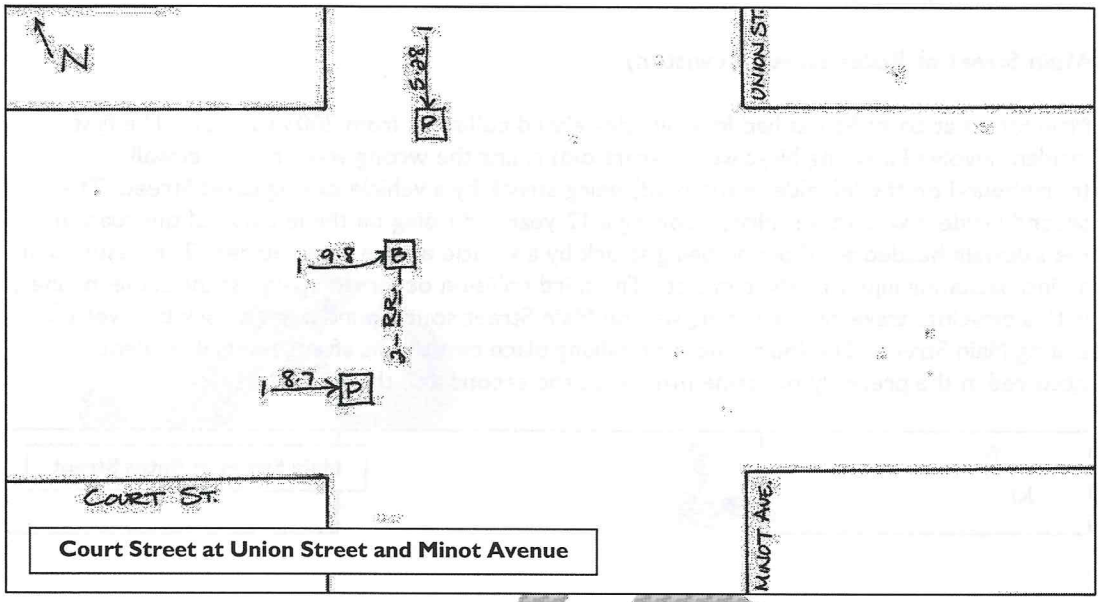
As with the pedestrian incidents, Lewiston experienced the vast majority of collisions, at 73 percent of the total, with Auburn at 22 percent; Lisbon and Sabattus had one incident each. It is interesting to note that bicyclists as a whole are less likely to be seriously injured than pedestrians. Only seven percent of the collisions, three incidents, resulted in serious injuries to the bicyclists that incapacitated them; no fatalities were recorded.

***Analysis of Crash Locations:*** While most locations experiencing a collision between a pedestrian or bicyclist with a motor vehicle only took place once in a three-year period, thus being a rather random event, several locations experienced multiple collisions with pedestrians or bicycles. These locations are discussed below with accompanying collision diagrams illustrating the incidents. In addition, the three fatal incidents involving pedestrians are also diagrammed and discussed.

### *Court Street at Union Street and Minot Avenue (Auburn)*

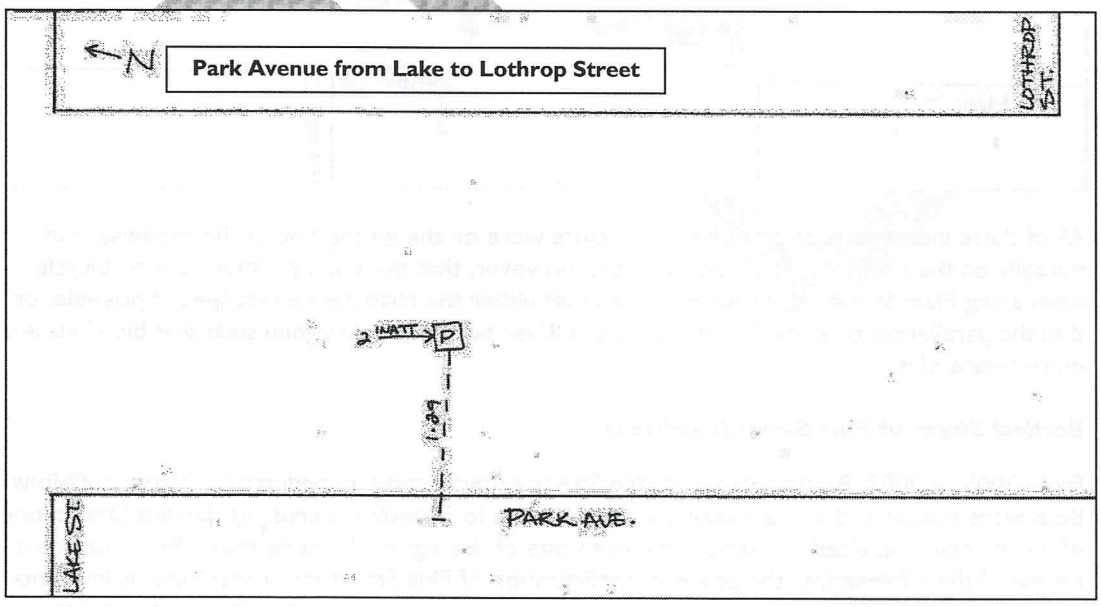
From 2005 to 2007, this location experienced two pedestrian collisions and one bicycle collision. The bicycle collision, which occurred in 2005, took place when an intoxicated bicyclist was riding in the wrong direction on the sidewalk on Minot Avenue toward Union Street and crossed in front of a left turning vehicle with a green arrow. The pedestrian collisions both occurred in 2006. The first one involved a pedestrian running quickly across Union Street from

Dennys to CVS and being struck by a vehicle destined for Minot Avenue. The second incident involved an adolescent running across the northwest approach of Court Street against the traffic signal and being struck by a vehicle destined for downtown Auburn; in this case, the pedestrian was seriously injured.




In the case of this location, the design of the intersection does not appear to have played a role in these incidents, other than the fact that it is a wide intersection with multiple approach lanes for each approach; it also should be noted that no bicycle lanes or shoulders are available at this location. The bicyclist and pedestrians did not use facilities and signal phasing correctly.

***Park Avenue from Lake Street to Lothrop Street (Auburn)***

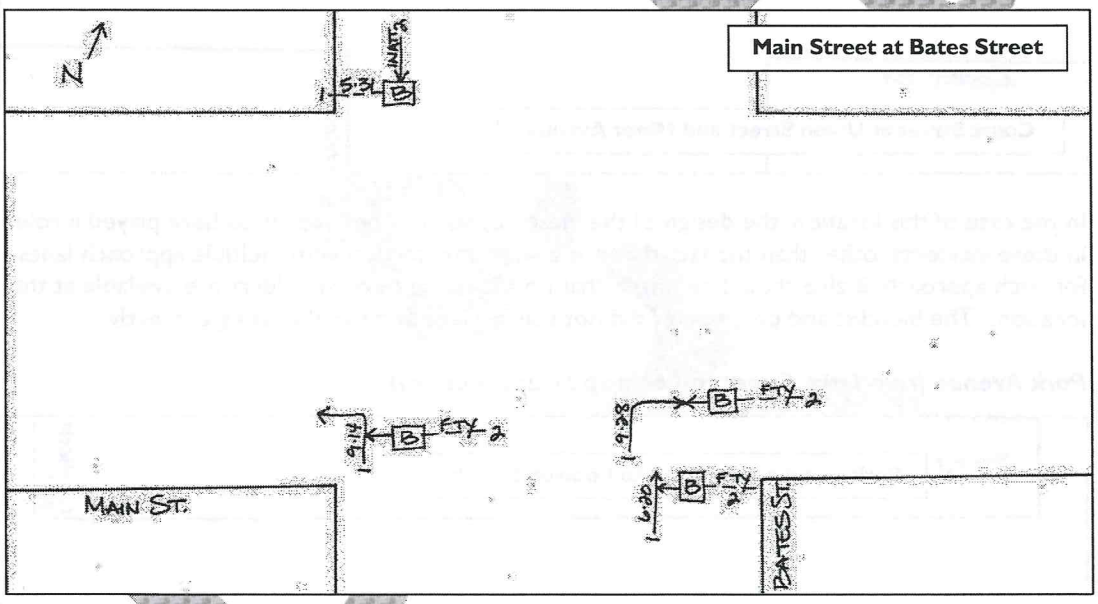



This incident involving a pedestrian and a vehicle resulted in a pedestrian fatality. An elderly person was checking for the mail and was struck by the mirror of a passing vehicle, which was

enough to knock the individual over and result in death. Although this incident appears to be the result of driver inattention, bicycle and pedestrian facilities on Park Avenue are limited, and a recent corridor study has called for a combination of improved sidewalks, bicycle lanes/shoulders, and some traffic calming to call attention to other modes along this corridor and to improve safety.

***Main Street at Bates Street (Lewiston)***

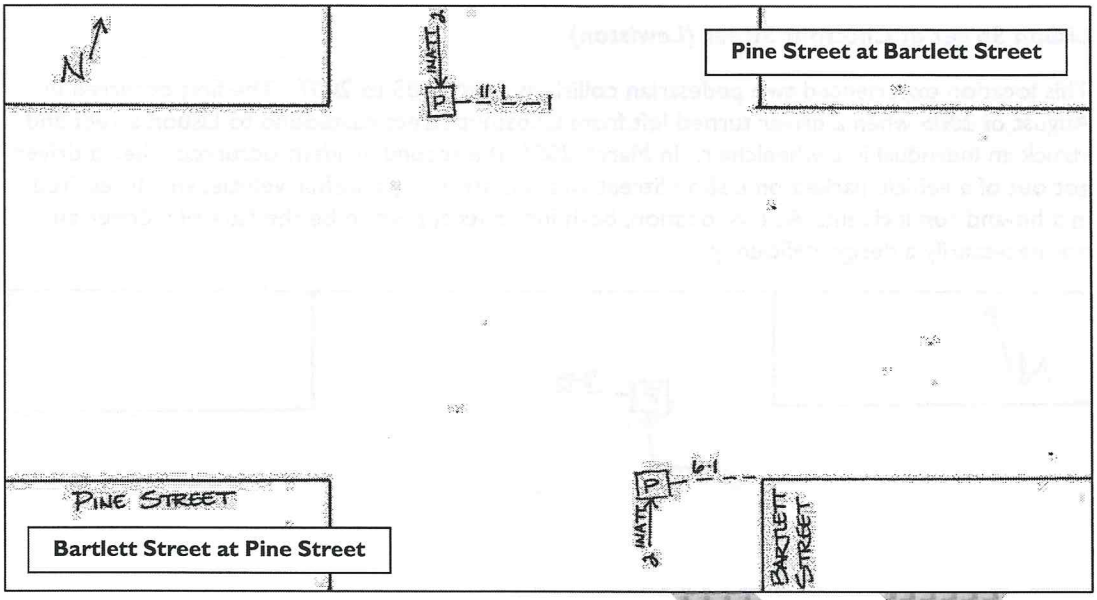
Main Street at Bates Street had four bicycle-related collisions from 2005 to 2007. The first incident involved a young bicyclist (12 years old) riding the wrong way on the sidewalk (northbound on the left side of the road) being struck by a vehicle exiting Bates Street. The second incident was very similar, involving a 12-year-old riding on the left side of the road on the sidewalk headed southbound being struck by a vehicle exiting Bates Street. This resulted in an incapacitating injury to the bicyclist. The third collision occurred in almost the same manner, with a bicyclists traveling the wrong way on Main Street southbound being struck by a vehicle exiting Main Street. The fourth incident, talking place two weeks after the third incident, occurred in the precisely the same manner as the second and third incidents.



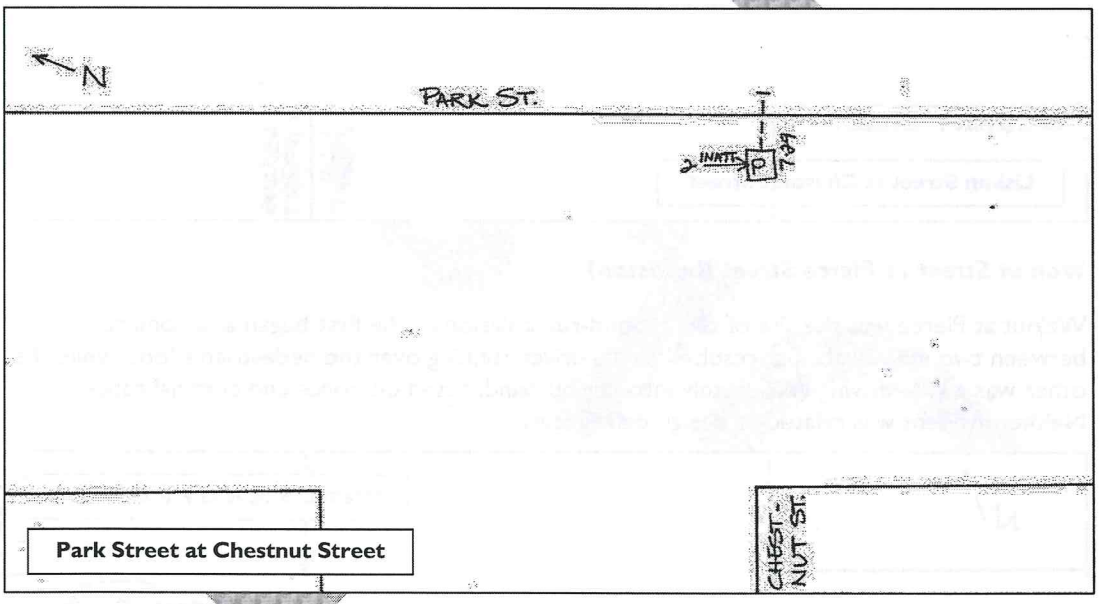

All of these incidents took place when bicyclists were on the wrong side of the roadway, and typically on the sidewalk. It should be noted, however, that there are no shoulders or bicycle lanes along Main Street. It is recommended that either the roadway be restriped, if possible, or that the parallel route along the Androscoggin River be adequately signed such that bicyclists are more aware of it.

***Bartlett Street at Pine Street (Lewiston)***

From 2005 to 2007, Bartlett Street at Pine Street experienced two pedestrian-related collisions. Both were similar in that the motorists did not react to pedestrians crossing Bartlett Street; one of the incidents resulted in a serious injury to one of the legs of the pedestrian. Based on the a review of the information, the one-way configuration of Pine Street may contribute to incidents at this location, as drivers on Bartlett Street tend to look one way when crossing the street.



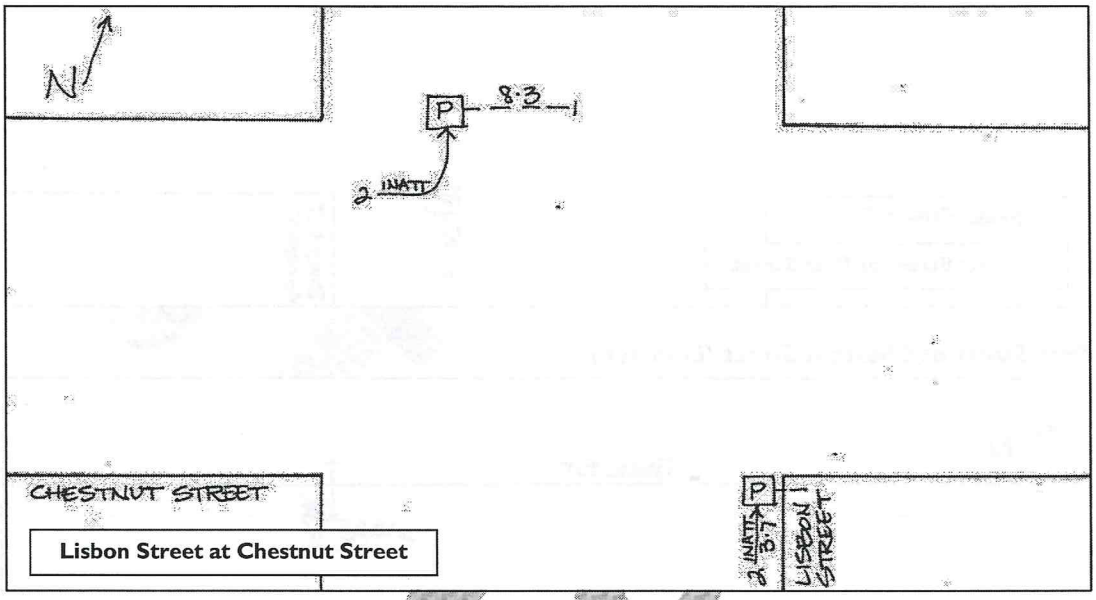

***Park Street at Chestnut Street (Lewiston)***




This location experienced a fatal collision between a motorist and a pedestrian in 2007. An older individual was crossing Park Street near Kennedy Park toward Chestnut Street in the crosswalk and was struck by the motorist. The resulting injuries were fatal to the pedestrian. This location may benefit from a more aggressive crosswalk treatment, such as a raised crosswalk or an inlaid treatment calling attention to the crossing.

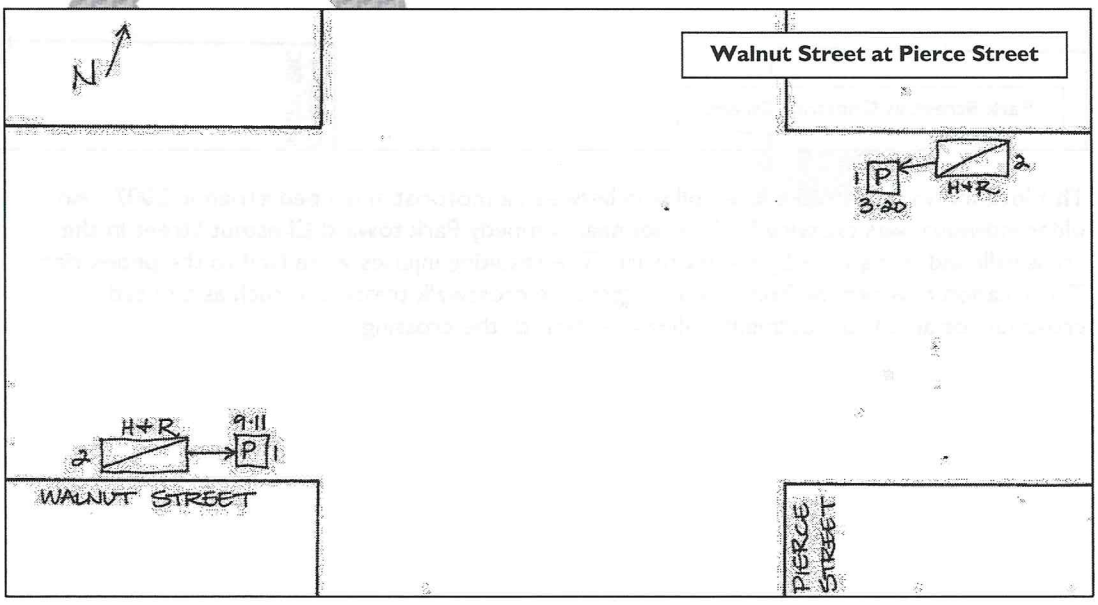
### *Lisbon Street at Chestnut Street (Lewiston)*

This location experienced two pedestrian collisions from 2005 to 2007. The first occurred in August of 2005 when a driver turned left from Chestnut Street eastbound to Lisbon Street and struck an individual in a wheelchair. In March 2006, the second incident occurred when a driver got out of a vehicle parked on Lisbon Street and was struck by another vehicle, which resulted in a hit-and run incident. At this location, both incidents appear to be the fault of a driver and not necessarily a design deficiency.



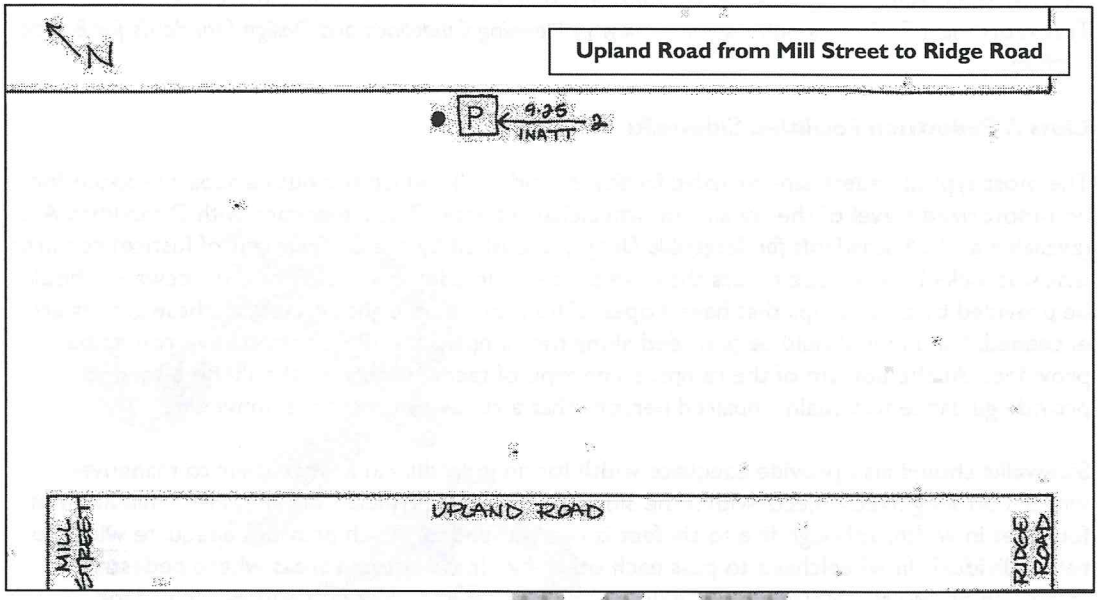

### *Walnut Street at Pierce Street (Lewiston)*

Walnut at Pierce was the site of two hit-and-run collisions. The first began as a conflict between two individuals that resulted in the driver running over the pedestrian's foot, while the other was a wife driving deliberately into her husband, based on police and criminal reports. Neither incident was related to design deficiencies.



### *Upland Road/Route 196 from Mill Street to Ridge Road (Lisbon)*

A fatality occurred at this location when a MaineDOT surveyor was struck by a driver. Based on the investigation, blown over signage may have played a role, but the surveyor was wearing an orange vest for visibility, and was in the paved shoulder at the time. As the event appears to be based on driver inattention, the fatality does not appear to be based on a design failure.




Based on a review of the significant crash locations, the main issue appears to be a lack of bicycle facilities in the downtown areas. However, and more unfortunately, most of these incidents range from driver inattention to actual premeditated action.

This being said, it is recommended that certain safety-related policies and procedures be enacted and followed as they relate to bicycles and pedestrians. These include, but should not be limited to, the following:

- Provide extensive bicycle and pedestrian education programs at schools to teach students about the rules of the road
- Install medians on wider roadways with multiple travel lanes where feasible
- Complete pedestrian counts at key locations to determine if more aggressive treatments, such as pedestrian-actuated signals or raised crosswalks would be appropriate
- Evaluate urban intersections operating under capacity to determine if an exclusive pedestrian phase would be appropriate, such as along Lisbon Street in downtown Lewiston
- Install visible crosswalks where desired, and at key locations, utilize more durable treatments, such as thermoplastic, or an inlaid treatment like DuraTherm/Jarvis imprint
- Establish truck routes through the urban core in order to minimize truck traffic on non-designated streets
- Where feasible and particularly on local (non collector or arterial) streets, revise curb radii to reduce crossing widths and, as such, time pedestrians spend crossing the street
- As discussed in other sections of this Plan, evaluate wide sections of roadways to determine if it is feasible to stripe shoulders and/or bicycle lanes

# Chapter 2: Classification/Description of Plan Facilities

For the purposes of this Plan, there are several classifications of facilities and amenities for bicycles and pedestrians. The designations discussed below for each category of facility have been compiled for the purposes of this Plan, and have been adapted from the classifications set forth by the *California Highway Design Manual* and additionally elaborated in the Institute of Transportation Engineers publication *Review of Planning Guidelines and Design Standards for Bicycle Facilities*.

### *Class A Pedestrian Facilities: Sidewalks*

The most typical pedestrian-exclusive facility is a sidewalk, which provides a separate space for non-motorized travel of the walking or wheelchair variety. The Americans with Disabilities Act (available as *ADA Standards for Accessible Design*, published by the Department of Justice) requires that sidewalks have a slope of less than five percent. In addition, access to the sidewalks should be provided by curb ramps that have slopes of no more than eight percent. If these grades are exceeded, hand rails should be provided along the ramps/sidewalks or alternative routes be provided. At the bottom of the ramps, some type of tactile detection should be placed to provide guidance to visually impaired persons that a roadway crossing is imminent.

Sidewalks should also provide adequate width for an individual in a wheelchair to maneuver without striking fixed objects within the sidewalk. As such, typical sidewalks are a minimum of four feet in width, although five to six feet is recommended, which provides adequate width for two individuals in wheelchairs to pass each other by. In downtown areas where pedestrian traffic can be heavy, determinations exist as published in the *Highway Capacity Manual* for additional width determinations. In some of the central business district locations, ten to twenty feet is not uncommon. Lastly, some delineation from the vehicular travel way should be provided, either in the form of an elevated section with curbing, or a grassy esplanade or swale.

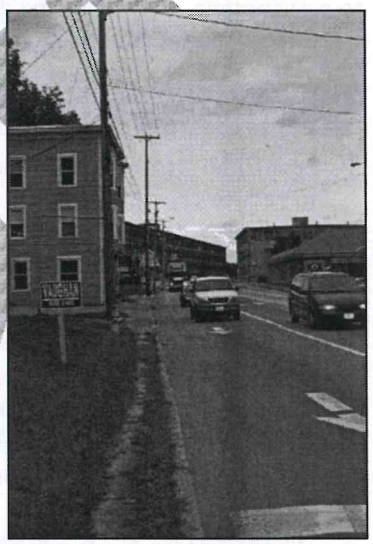
**Sidewalks along Elm Street, Auburn**

There are over 150 miles of sidewalks in the communities of Lewiston, Auburn, Lisbon and Sabattus. As determined in the 2002 Plan, the majority (75 percent) of these facilities were in adequate condition for most pedestrians. However, many still do not have curb ramps, although at this time, wherever sidewalks have been added or reconstructed, ramps and related facilities have been added, be it along Route 196 in downtown Lisbon Falls, or along Turner Street by the Auburn Mall.

The region is little more than halfway toward the goal of having sidewalks on both sides of arterials and collectors within the urban core. However, at this time, many of the obstacles prohibiting additional sidewalks along major travel corridors are significant, ranging from insufficient right-of-way to grading and drainage issues to funding deficiencies. Regardless of these issues, this goal should remain.

## Network Gaps in Sidewalk Facilities for Plan Municipalities

| Network Gaps | Examples |
|---|---|
| **No sidewalks on either side of road** | **Auburn:** All or portions of Gracelawn Road, Hotel Road, Lake Auburn Avenue, Manley Road, Park Avenue, Turner Street **Lewiston:** All or portions of Adams Avenue, Central Avenue, Fair Street, Montello Street, South Avenue, Webber Avenue, Scribner Boulevard **Sabattus:** High Street |
| **Sidewalks on only one side of road** | **Auburn:** All or portions of Academy Street, Lake Street, Mechanics Row, Mount Auburn Avenue, Poland Road, South Main Street **Lewiston:** All or portions of Bartlett Street, College Street, East Avenue, King Avenue, Pleasant Street, Russell Street, Webster Street **Lisbon:** All or portions of Lisbon Road, High Street, Pleasant Street **Sabattus:** Green Street, Main Street |
| **Discontinuous sidewalks along road** | **Auburn:** Center Street, Gamage Avenue, Minot Avenue, Turner Street, Washington Street, Western Avenue **Lewiston:** Canal Street, Main Street **Lisbon:** Main Street, Lisbon Road, School Street, Village Street |



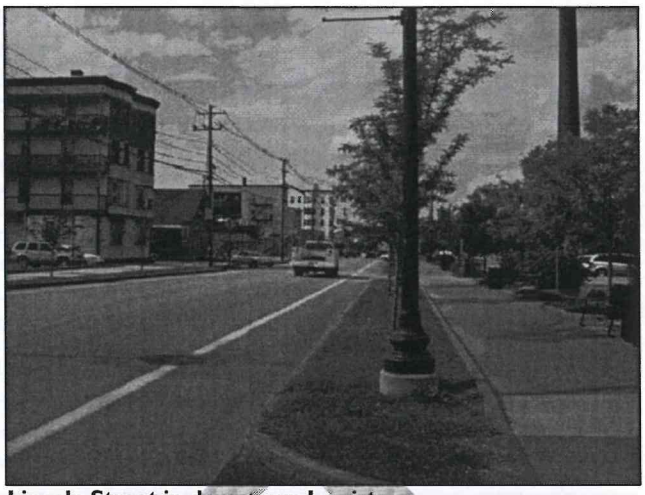
*"Cowpaths" along Minot Avenue show where pedestrians travel, with or without sidewalks. These locations indicate a location where pedestrian desire lines exist, but no facility exists. Such places are clearly not ADA-compliant, and as such, can result in those with mobility issues potentially having to utilize the street itself.*



As discussed above, completing gaps in the sidewalk network may be limited by physical constraints such as severe topography or the presence of trees, utilities, and buildings set close to the street. Other gaps might be addressed through the following sources:

- *Local capital improvement programs:* Address short gaps, particularly on road segments not scheduled for full reconstruction in the Six Year Plan.
- *Road reconstruction projects:* Include sidewalks, new and rehabilitated, on both sides of arterials and collectors within the urban core.
- *New development:* Require external and internal pedestrian access, such as new sidewalk construction to the nearest connecting sidewalk (where feasible) or a reduction in parking requirements to extend or construct a pathway.

***Pedestrian Districts:*** Pedestrian districts are dense, mixed-use locations within the urban core where "people" traffic is both expected and encouraged. Some districts are located in downtown or village settings that reflect a compact pattern of development. Others are anchored by major institutions, such as hospitals, mills, colleges, and malls. Whether they developed in the last 10 or 100 years, these locations are characterized by mixed-use—homes, apartments, businesses, offices, and public buildings—and density—multiple attractions in close proximity to one another. The following design treatments are recommended to create and maintain pedestrian-friendly districts:

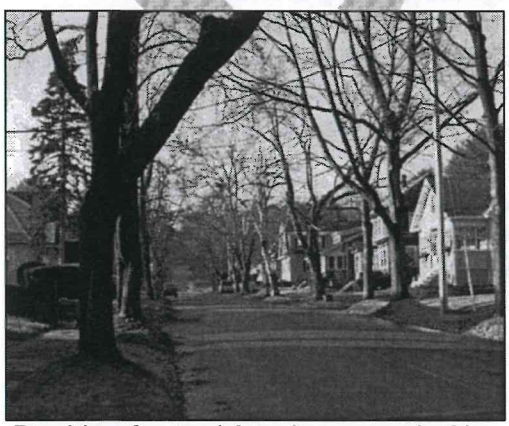


**Lincoln Street in downtown Lewiston.**

- Wider sidewalks on both sides of arterials and collectors with esplanades, curbing, lighting, and street trees, all placed at a human scale
- Pedestrian treatment at intersections, such as touch-free pedestrian signals, curb extensions to reduce crossing distance, landscaped medians for refuge, and textured crosswalks for visibility
- Pedestrian amenities, such as benches, artwork, drinking fountains, trash cans, telephones, newsstands, directional signage, and kiosks
- Open space, such as squares, plazas, and courtyards
- Linkages to other modes of transportation, such as bike racks and sheltered bus stops

Zoning and land-use policies that support compact development will also facilitate walking (as well as bicycling) in pedestrian districts:

- Mixed uses, including residential, retail, commercial, and institutional development
- Variety of high-density housing, such as apartments, multi-family and single-family homes
- "Renaissance proportions" of 1:4 that define the ideal relationship between building height and street width, i.e., for every foot of a building's height there should be no more than four feet of space setback, sidewalk, street width) in front of it
- Zero setbacks for retail and commercial buildings with parking provided on the side or in back
- Orientation of building signs, awnings, and facades to the street
- Preservation of historic architecture and buildings through rehabilitation and adaptive re-use
- Design guidelines to create and preserve the unique character of a district
- Reduction in parking requirements to pay for green infrastructure, including open space, pathways, and sidewalks



**Densities of up to eight units per acre in this typical neighborhood on Goff Hill in Auburn result in a walkable, bike able area.**

## *Paths and Multi-Use Paths*

Approximately 50 miles of pathways are proposed on the region's 2030 Vision Map. The discussions on the following pages illustrate the proposed network as well as the high priority pathway projects. In some cases, these alternate routes include on-road segments to address gaps where right-of-way can not be acquired and to provide a seamless transition to the street network.

### *Class B Pedestrian Facility: Paths*

Most pedestrian-oriented pathways are rural and recreational in nature, providing opportunities for hiking. These pathways should be kept free of brush or other obstructions and a minimum of four feet in width, with six feet in width or greater in locations where users are common.

The paths should also be clearly marked with a consistent colored blaze. These can range in spacing from a few hundred feet in cases where the trail clarity is low to every 800 to 1,000 feet where the trail location is very clear. In addition, occasional signage with the name of a trail or distances to destinations should also be provided.

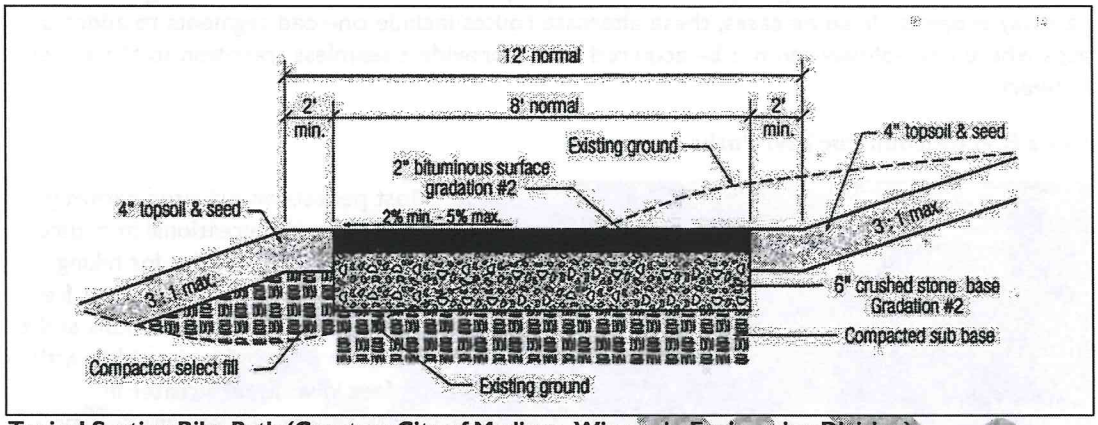
Pedestrian-oriented trails and footpaths number in the hundreds, providing access to parks and public lands such as Mt. Apatite and Thorncrag, shortcuts through neighborhoods, such as Park Avenue to Goff Hill, and long routes for cross country running, skiing, and mountain biking. Although there is no complete inventory of off-road trails in the region, these could be mapped with the aid of United States Geological Survey (USGS) maps and Global Positioning System (GPS) units. In addition, LA Trails has an extensive database of trail facilities available. If desired, some of these informal trails could be upgraded with grading, drainage and surface treatments such as stone dust or better to result in a Class 1-A facility, discussed as follows.

### *Class 1-A Bicycle Facilities: Multi-Use Paths*

A multi-use path is a travel facility designed solely for non-motorized modes of travel. In addition to bicycles, typically pedestrians are also permitted to utilize these facilities, as well as equestrians and rollerbladers. As set forth in *Review of Planning Guidelines and Design Standards for Bicycle* Facilities, published by the Institute of Transportation Engineers, these facilities typically have a fine gravel or stone dust surface treatment at a minimum, and ideally have a bituminous asphalt or similar material to allow road bicycles to utilize the facility. Multi-use paths should typically be graded at no more than an eight percent slope to allow cyclists of varying abilities to utilize them.

A number of opportunities exist for multi-use paths in Lewiston, Auburn, Lisbon and Sabattus. Ideally, these paths can be constructed on independent rights-of-way, such as abandoned railroad beds, old trolley lines, canals, river corridors, and power lines. Although off-road and separated routes offer unique benefits in terms of scenery and safety a path could be constructed within the road right-of-way separated by a grassy buffer. In addition, if sufficient right-of-way exists, a multi-use path could be constructed adjacent to an active rail line,

something recently completed in the Hallowell area. There are over ten miles of multi-use paths in the ATRC region, including the Union Street Gully Parkway, River Walk, Railroad Park, the Ricker and Paper Mill Trails, Franklin Pasture Trail, and Gas Light Park.




**Typical Section Bike Path (Courtesy City of Madison, Wisconsin Engineering Division)**

The width of a multi-use path can also vary, depending on both the level of use and the types of use intended. Many paths are eight to ten feet in width, which allows for a four to five-foot travelway in each direction. Ideally, each direction is separated by a dashed yellow line, similar to the treatment used for a motorway. Wider widths, such as twelve to twenty feet can allow for separate lanes for bicycle and pedestrian traffic if so desired.

Winter maintenance for a multi-use path may depend on its intended use. If the path is primarily recreational in nature, a municipality may opt to allow snow to accumulate on the route to allow for snowshoeing, cross-country skiing, or other seasonal activities. However, if it is determined that the path serves more of a commuter (i.e. non recreational) purpose, the facility should be kept clear of snow.

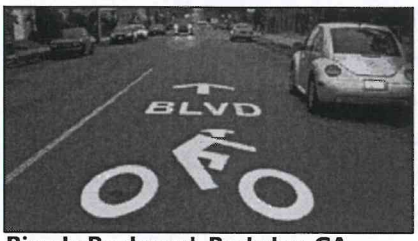
In the case of a path along an active rail line, a minimum separation of fifteen feet should be provided from the edge of the path to the centerline of the railway with fencing, or 25 or more feet if fencing is not used and grade separation or vegetation is utilized as a buffer. Additional information can be found in the FHWA publication *Rails-with-Trails: Lessons Learned.*

## *On-Road Bicycle Facilities*

Creating bicycle facilities on existing roads is the most cost efficient way to accommodate bicyclists while maximizing public investment in right-of-way. A bicycle facility is created when an appropriate design treatment is applied to a road. What is appropriate depends on the road's existing width, speed, and traffic volume, as well as the availability of alternate or parallel routes for bicyclists. Currently, there are over 80 miles of roads in Androscoggin County with paved shoulders of at least four feet, the minimum width necessary to safely accommodate bicycles.

On-road bicycle facilities offer the advantage of providing clear striping to indicate for motorists to move toward the center of the roadway as much as practicable, creating street space for cyclists. As such, they also encourage bicyclists to ride on the road in the same direction as traffic, where they are more visible to drivers. As a result, on-road facilities typically result in more predictable turning movements by both drivers and bicyclists, which is when conflicts are most likely to occur.

### *Class I-B Bicycle Facilities: Bicycle Boulevards (Shared Roadways)*




**Bicycle Boulevard, Berkeley, CA (Berkeley Office of Transportation)**

Bicycle boulevards utilize existing roadways, typically localized residential streets with low overall motorized traffic volumes consisting of locally-destined vehicles. These streets typically run in parallel with major motorized traffic routes (or provide connections between other routes) and provide a safer and more amenable alternative to bicyclists, be they recreational or commuter in nature.

Bicycle boulevards typically have signage and markings specific to their use, making it clear that it is a designated route. Ideally, they would also have wayfinding signage informing bicyclists of major destinations, such as the primary route parallel to the boulevard or some other major point of interest, including other bicycle facilities.

Because they offer the most residential streets with low traffic volumes, roadways in Lewiston and Auburn offer the greatest opportunities for bicycle boulevards. Streets such as Avon Street and Brault Street in Lewiston would be possible candidates for such treatments. North River Road and Davis Street in Auburn also provide bicycle boulevard potential.

### *Class II Bicycle Facilities: Bicycle Lanes*

The use of bicycle lanes allows for motorized and non-motorized traffic to utilize the same route with a minimum of conflict. Based on current criteria published in the *Highway Design Guide* by AASHTO, the minimum acceptable width is four feet, while five feet is preferable, particularly for an urban street with curbing. As current Maine law requires that a motorist provide a minimum of three feet when passing a bicycle, five feet allows for additional clearance distance to minimize the potential for a motorist to cross the center line of the roadway.

Bicycle lanes should have bicycle-specific markings delineating their location, with wayfinding signage available as needed. A number of locations in the ATRC region already have bicycle lanes, including portions of College Street and Lincoln Street in Lewiston, as well as portions of Main Street, Mount Auburn Avenue, and Turner Street in Auburn.

There are approximately twenty miles of wide curb lanes in Lewiston and Auburn alone that could be striped to create bike lanes. These urban streets have a minimum pavement width of at least 30 feet, which allows for two eleven-foot travel lanes and two four-foot bike lanes. Many will not require significant changes in traffic patterns, such as a reduction in the number of travel lanes, the width of travel lanes, or the availability of on-street parking. However, as the changes may result in relocating on-street parking to one side of the street only, a public process should be initiated prior to any implementation. Striping could be accomplished during routine spring maintenance or road resurfacing projects at minimal cost.

## Candidates for Bicycle Lanes Via Restriping

| Auburn | | |
|---|---|---|
| **Street** | **Description** | **Pavement Width (feet)** |
| Court Street | Fairview Street to Park Avenue | 36-38 |
| Dennison Street | Gamage Avenue to Turner Street | 30-36 |
| Elm Street | Minot Avenue to Main Street | 44 |
| Gamage Avenue | Goff Street to Park Avenue | 32-40 |
| Goff Street | Court Street to Gamage Avenue | 34-36 |
| Hampshire Street | Gamage Avenue to Turner Street | 32-36 |
| Lake Auburn Avenue | Turner Street to Center Street | 30-34 |
| Manley Road | Hotel Road to Court Street | 30-36 |
| Minot Avenue | Western Avenue to Hotel Road | 50-54 |
| Poland Road | Minot Avenue to Hotel Road | 32-40 |
| Riverside Drive | Mill Street to Brook Street | 32-45 |
| Rodman Road | Poland Road to Washington Street | 30-35 |
| Spring Street | Elm Street to Hampshire Street | 34-44 |
| Turner Street | Union Street to Gracelawn Road | 30-45 |
| **Lewiston** | | |
| Ash Street | Canal Street to Webster Street | 32-36 |
| Bartlett Street | Oak Street to Adams Avenue | 34 |
| Bates Street | Oak Street to Birch Street | 34-54 |
| Birch Street | Bates Street to Jefferson Street | 32-36 |
| Canal Street | Main Street to Cedar Street | 26-42 |
| Central Avenue | Webster Street to Russell Street | 30-46 |
| College Street | Bates Street to Campus Avenue | 32-38 |
| East Avenue | Lisbon Street to Montello Street | 37-50 |
| Lincoln Street | Cedar Street to Locust Street | 30-44 |
| Mollison Way | Main Street to Montello Street | 32 |
| Montello Street | Old Green Road to Highland Spring Road | 37 |
| Park Street | Oak Street to Adams Avenue | 24-34 |
| Webster Street | Central Avenue to Farwell Street | 40-48 |



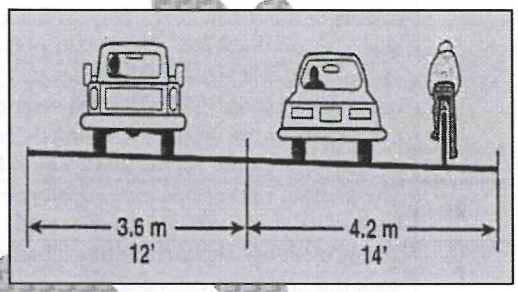
***Class III-A Bicycle Facilities: Bicycle Routes with Paved Shoulders***

Certain roadways may not have specific bicycle lanes or striping, but may still accommodate bicycles. In the case of Class III-A facilities, these roadways have a paved shoulder four or more feet in width, to allow for the safe passage of vehicles. In addition, signage designating the roadway as such alerts motorists to the fact that bicycles will likely be present.

These treatments are particularly desirable for roadways with speeds posted in excess of 30 mph and daily traffic volumes of more than 3,000 vehicles per day, as this level of vehicular traffic poses a chronic potential for conflicts with bicycles.

There are numerous such roadways with paved shoulders in the Lewiston, Auburn, Lisbon and Sabattus area, including the following:

- ***Lewiston:*** Route 196, Route 126, Route 202, Alfred Plourde Parkway, Webster Street, Pond Road
- ***Auburn:*** Route 4, Route 100, Route 11, Turner Street, Mount Auburn Avenue, Court Street
- ***Lisbon:*** Route 196, Route 9, Route 125
- ***Sabattus:*** Route 126




New shoulders can and should be paved as part of road reconstruction projects where feasible. One recent project resulting in paved shoulders is Route 136 in Durham, south of Auburn; this route has been proven to be popular with bicyclists, offering a connection to Brunswick and Freeport. The Maine Department of Transportation has developed a policy to pave shoulders during reconstruction when the road meets certain criteria, such as high traffic volumes. This policy could serve as a guide for local governments and the Androscoggin Transportation Resource Center.

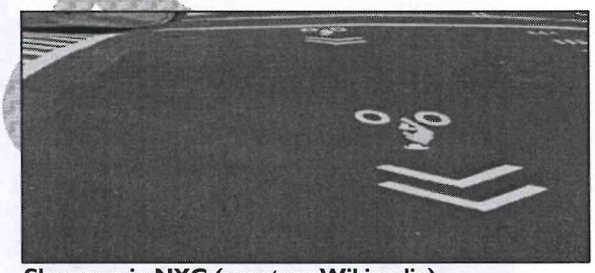
**Bicycle lane on College Street, Lewiston**

The Highway Improvement Scoring Formula used by ATRC awards up to five points, out of 100, for the creation of new bicycle and pedestrian facilities on roads scheduled for reconstruction. This formula is detailed in the table on the following page:

## ATRC Point System for Bicycle/Pedestrian Facilities in Road Reconstruction Projects

| Points | Criteria | Example |
|---|---|---|
| 5 | The project is located in a pedestrian district and will include new and/or improved bicycle/pedestrian facilities, such as bike lanes, sidewalks with esplanades, and other streetscape improvements and amenities. A pedestrian district is a dense, mixed use area where a high volume of "people" traffic is both expected and encouraged, such as downtown Auburn and Lewiston, Lisbon Falls, Sabattus Village, Auburn Mall, and Lewiston Mall. | Central Ave (Lew)<br>Court St (Aub)<br>Lisbon St (Lew)<br>Turner St (Aub)<br>Main St (Lisb) |
| 4 | The project will include NEW bicycle AND pedestrian facilities where none exist but are warranted. Sidewalks are warranted on arterial and collector streets in the urban core. Bicycle facilities are warranted on roads identified as bikeways on the ATRC 2030 Vision Map. | Park Ave (Aub)<br>Bartlett St (Lew) |
| 3 | The project will include NEW bicycle OR pedestrian facilities where none exist but are warranted. Sidewalks are warranted on both sides of arterial and collector streets in the urban core. Bicycle facilities are warranted on roads identified as bikeways on the ATRC 2030 Vision Map. | Russell St (Lew)<br>Stevens Mill (Aub) |
| 2 | The project will replace existing bicycle and pedestrian facilities where such facilities have excessively deteriorated. | Lake St (Aub) |
| 1 | The project will replace existing bicycle and pedestrian facilities, such ADA sidewalk modifications and re-striping of existing shoulders. | Sabattus St (Lew) |
| 0 | No facilities are planned. | N/A |

***Class III-B Bicycle Facilities: Bicycle Routes with Wide Shared Lanes***



**Sharrows in NYC (courtesy Wikipedia)**

On narrower roadways, preferably those with lower speeds and/or vehicular volumes (under 30 mph and 3,000 vehicles per day are preferable), the travel lane can be shared with cars and bicycles. Ideally, the lane would be a minimum of fourteen feet in width. The lane should be striped with a "sharrow" a shared marking signaling to bicyclists and motorists alike that the roadway travel way serves both uses.

A number of streets may fit into this category in the ATRC region. Ash Street, Birch Street, and Mollison Way are all potential candidates for this type of treatment in Lewiston. In Auburn, Spring Street, Poland Road, portions of Turner Street and Gamage Avenue are good candidates.

***Inclusion Criteria for Facilities in Plan***

The following Principles were used to select facilities for inclusion in the plan:

***Accessibility:*** The facility or route…

- ❖ Is located near densely populated residential neighborhoods
- ❖ Provides easy access to significant destinations, such as downtown areas, parks, schools, colleges, shopping districts, or business centers
- ❖ Serves a specialized population likely to commute to a set destination point, such as school children, senior citizens, college students, or the disabled

***Safety:*** The facility or route…

- ❖ Follows or parallels a road without adequate facilities that bears high traffic volumes and speeds, excessive turning movements, congested intersections, heavy truck traffic, and/or a pattern of bicycle/pedestrian accidents (or calls for improving facilities on said routes)
- ❖ Minimizes conflicts with motor vehicles

***Connectivity:*** The facility or route…

- ❖ Provides a direct connection to an existing or scheduled transportation project
- ❖ Acts as a major connection between municipalities for those wishing to commute via non-motorized roadways
- ❖ Is, where feasible, located within a quarter mile (approximately 1,300 feet) of a transit route

***Route Attractiveness/Usability:*** The facility or route…

- ❖ Provides a pleasant or scenic travel corridor
- ❖ Is relatively flat, with few inclines over eight percent

***Cost:*** The facility or route…

- ❖ Can be implemented in conjunction with road improvements or new construction
- ❖ Contains adequate right-of-way
- ❖ Costs in line with industry standards for similar facilities

# Chapter 3: Additional Facility Recommendations

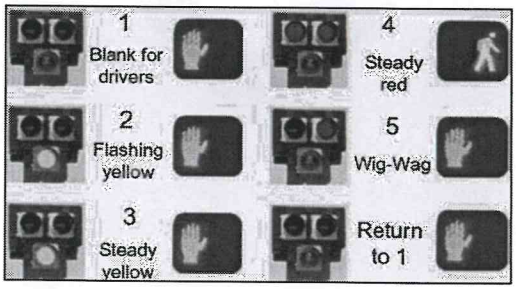
The facilities discussed in Chapter 2 of this report have their own design considerations. However, additional considerations for specific facilities are also of great importance.

### *Traffic Signals*

- *Pedestrian Countdown Heads:* Already finding favor in ATRC communities, it will be required for all pedestrian heads to show the number of seconds remaining in the pedestrian phase. Studies have shown that this results in less pedestrian and driver confusion.
- *Reduction in Traffic Signal Cycle Lengths:* Primarily in urban locations, where capacity is not of an issue, the cycle lengths should be made as short as reasonably possible to still accommodate vehicle progression. Shorter cycle lengths result in less time waiting for pedestrians to wait for their phase, and as a result, result in a reduced potential for a pedestrian to cross "against" traffic.
- *Right-Turn on Red:* Maine traffic statutes allow for vehicles to make right turns at a red ball unless otherwise specified. In a location with sidewalks and significant pedestrian activity, this can result in potential conflicts between vehicles and pedestrians. Therefore, it is recommended for the municipalities to examine locations with traffic signals for the potential of placing "No Right Turn on Red" signage to minimize the potential for such conflicts.
- *Leading Pedestrian Interval:* A leading pedestrian interval (LPI) is an exclusive pedestrian phase for a brief period of time (typically in the order of three to seven seconds, depending on a specific location) that transitions to a concurrent pedestrian phase. It is a compromise between an exclusive and concurrent pedestrian phase philosophy, providing the opportunity for pedestrians to have visibility in the intersection before vehicles proceed while resulting in less all-red time for vehicles compared to an exclusive pedestrian phase. Where determined appropriate, this phasing can improve safety as well as the feeling of safety for pedestrians. A video providing a summary of how an LPI operates is available for viewing at http://www.streetfilms.org/archives/lpi-leading-pedestrian-interval/.

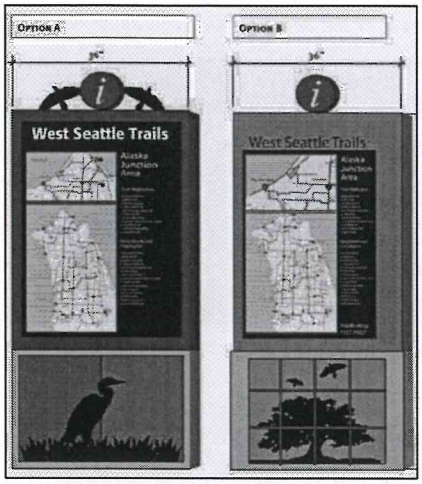

**A still excerpt from an LPI video. (Streetfilms)**

- *HAWK:* At many mid-block or otherwise unsignalized pedestrian crossings, various forms of pedestrian-actuated beacons have been developed. More recently, a beacon developed in Tuscon, Arizona has been gaining acceptance in the engineering community and is expected to be adopted in future versions of the Manual of Uniform Traffic Control Devices (MUTCD). The beacon is actuated by a pedestrian and goes through five phases prior to reaching its rest stage. It is linked with standard pedestrian crossing heads. It should also be noted that the HAWK is anticipated to be the preferred method of providing a signalized pedestrian crossing at multilane roundabout approaches, as required by pending ADA requirements. A video is available at http://www.youtube.com/watch?v=ReNk2T5ay1c.




**HAWK operational phases (ITE).**

### *Wayfinding Signage/Kiosks*




**Seattle trail wayfinding kiosks.**

As discussed previously in this report, signage can play a valuable role on designated bike routes, making it easier for bicyclists to understand which roadways are desired. Wayfinding signage is also important for all travelers, and the height, design and clarity of the signage should take into account the needs of non-motorized travelers. Ideally, each town or cluster of towns would determine an overall sign design for consistency, and employers requiring signage could have signs constructed to adhere to these standards.

At major points of confluence for bicycle routes, particularly in downtown Lewiston or Auburn, the provision of kiosks may be helpful. They could provide copies of route and trail maps, as well as transit information.

### *Crosswalk Design*

**Zebra crossing in Burnaby, British Columbia.**

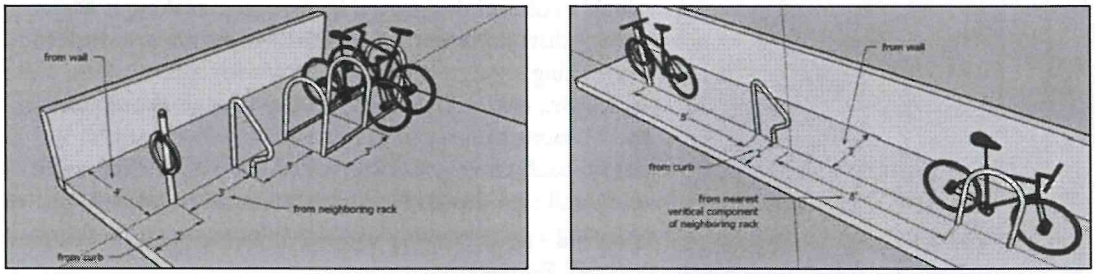
Unfortunately, pedestrians in a crosswalk can still be at risk of being struck by a vehicle, even if the crosswalk is striped. The striping of two parallel lines for crosswalks, still done at many places in the ATRC region results in poor visibility for drivers. From any significant distance, these lines disappear from the driver's eye. The use of international standard crossing markings (often referred to as a "continental" or "zebra" crosswalk) with wide markings parallel to the direction of vehicular traffic, should be used at all pedestrian crossings. In addition, at locations where visibility is desired at all times, the municipalities may wish to investigate alternatives to regular paint. Although crosswalks are frequently six feet in width in the ATRC municipalities, it is recommended that eight feet be considered a minimum width, with ten feet or greater in key crossing locations.

One commonly used material is thermoplastic, a raised reflective material applied with heat that bonds with the asphalt pavement. Although more costly, it lasts for several years if applied correctly. Other, more costly alternatives, such as DuraTherm or Jarvis imprint are inlaid materials at the same level at pavement; these alternatives are significantly more costly, but are worthy of investigating when a roadway is resurfaced; installed correctly, these methods will last as long as the roadway surface itself. For maximum longevity, the crosswalk stripes should be placed between the prevailing tire paths of motor vehicles.

### *Bicycle Storage Facilities*

There are a variety of bicycle storage facilities within the ATRC communities, where such facilities are available at all. However, few of these storage facilities meet modern bicycle storage criteria. The majority of these facilities tends to be the older "radiator" (or "wheel-bender") style and can often result in damage to bicycles. It is recommended that the ATRC communities update their technical standards to include requirements for contemporary

facilities, as well as requiring bicycle storage for all commercial and public facility site development plans.




**Outdoor bike storage and design guidelines. (City of Cambridge, Massachusetts)**

### *Lighting*

Adequate lighting should be provided at all pedestrian crossings and intersections in general. If local requirements do not address lighting issues, MaineDOT has lighting requirements that can be referred to. In addition, a wealth of information is available in the AASHTO publication *Informational Guide for Roadway Lighting.* In urban locations or even rural locations expecting to have significant volumes of pedestrian and bicycle traffic, lighting should be provided to allow for full-time use of facilities.

Lighting should be placed in cut-off fixtures that provide light only to desired areas, so as to avoid issues of light pollution and intrusion upon adjacent areas, particularly residential. The preferred types of lighting for pedestrian or bicycle use are mercury vapor, metal halide, or incandescent; however, the latter variety consumes significant energy and may not be desirable from that standpoint. If low power consumption is desirable, high-pressure sodium fixtures may be used. In the future, other lighting technologies offering longevity, brilliance, and low power use such as light emitting diodes (LED's) and organic light-emitting diodes (OLED's) may provide additional opportunities for bicycle and pedestrian facilities.

### *Bicycle Facilities: Special Cases*

For the most part, well-designed shoulders or bicycle lanes alongside standard vehicular travel lanes are sufficient for safe passage for bicyclists. However, there are a few situations that in particular may warrant special treatments.

*Large Signalized Intersections: Bicycle Boxes*

Although there are not a large number of signalized intersections with a significant number of approach lanes in communities in the ATRC area, certainly there are several. Typically, as a bicycle lane approaches a large signalized intersection, it is stationed between the outer through lane and the right turn lane. If a bicyclist wishes to turn left, he or she must ride with traffic in a non-designated space, and if the bicyclist is in a dual left lane or greater, or is not at the front of the queue, drivers may not see him or her.

**Green bicycle box in Portland, Oregon. (StreetFilms)**

An identified solution to this situation is the use of the bicycle box, which is an area approximately six to ten feet in width in front of the stop bars for vehicles. A bicyclist can sit in the box in front of traffic, where visible, and therefore, proceed with a greater degree of safety. Both traditional loop-based and video-based vehicle detection

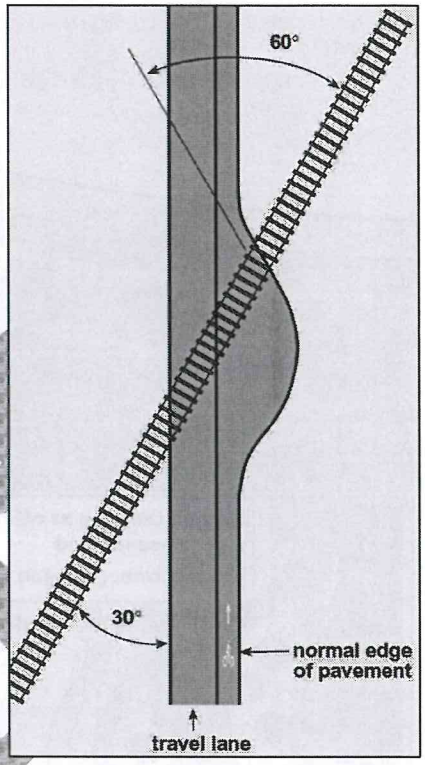
can be adapted to detect bicycles waiting within the boxes to allow for actuation of the signal by bicycles. In some municipalities, such as Portland, Oregon, a bright green color has been used to fill in the bicycle box for added visibility. A video of these Portland bicycle boxes in use can be viewed at http://www.streetfilms.org/archives/portland-green-bike-box/.

*Railroad Crossings*

Railroad crossings pose a perennial difficulty for bicyclists, particularly when the crossing is at an acute angle with the roadway. The tracks can "catch" a bicycle tire, resulting in loss of control and a rider being thrown into traffic. In Lewiston, Auburn, Lisbon and Sabattus there are many rail crossings, a significant number of which are along high-volume collector roads and arterials.

There are two potential solutions to this situation. The first is the provision of rubber inserts or concrete between the tracks and the roadway, which narrows the crossing width and reduces the potential for bicycle tires being "caught" in the track crossing. While the rubberized crossing may provide a smoother ride, it is more likely to result in slippery conditions when wet.

If the angle of crossing is extremely oblique, typically 30 degrees or less, it may be necessary to widen the edge of the roadway immediately prior to the crossing. This widening allows for bicyclists to adjust their crossing angle over railroad tracks and minimize the potential for a spill.

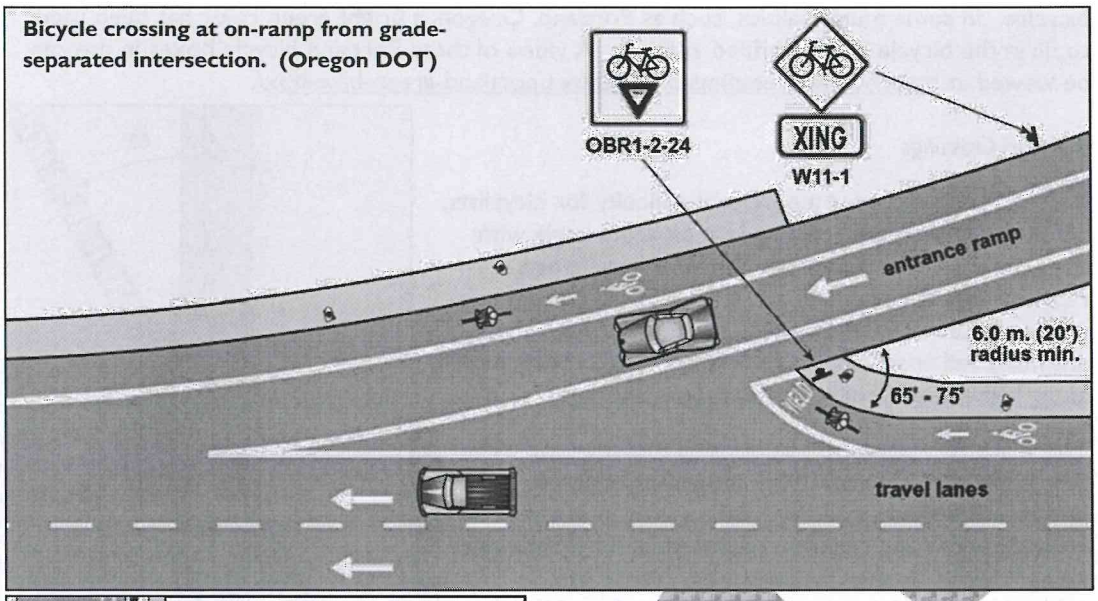



**Bicycle crossing over railroad tracks. (Oregon DOT)**

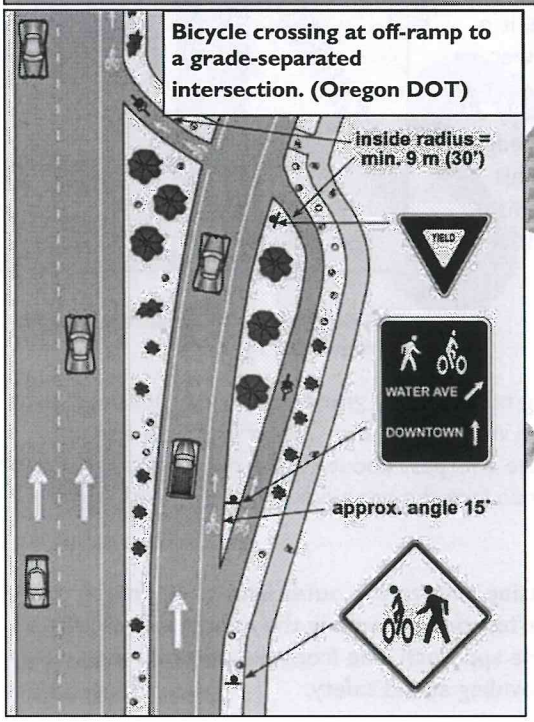
*Ramps at Grade-Separated Crossings*

Another difficult location for bicyclists is accessing non-highway grade-separated crossings, such as the Veteran's Bridge crossings over Main Street in Lewiston and Center Street in Auburn. Bicycles transitioning from the streets below or the overpass above to the non grade-separated portions of Russell Street or Mount Auburn Avenue face the problem of merging with high-speed traffic and crossing lanes.

For bicyclists coming off of the overpass and crossing over to the outer lane, an approach to minimize safety concerns is to stripe the shoulder/bicycle lane exiting the overpass such that a tight radius turn results in the bicyclist crossing the approach lane from the on-ramp in a perpendicular fashion, improving visibility, and providing added safety.




Bicycle crossing at on-ramp from grade-separated intersection. (Oregon DOT)




Bicycle crossing at off-ramp to a grade-separated intersection. (Oregon DOT)

On the other hand, for bicyclists crossing over an off-ramp to remain on the overpass, a different improvement is in order. In this case, a separate bicycle lane splits off from the primary lane or shoulder on the off-ramp, and is followed by a tight radius where once again, the bicyclist ultimately crosses the lane (of the off-ramp) at a perpendicular.

For both treatments, the turning radius should be sufficiently small such that bicycles are forced to slow down, but not so small that bicyclists could lose control of their bicycles. In addition, proper sight distances should be established from the point where the bicyclists cross the travel lanes so that they can see and can be seen from an adequate distance.

# Chapter 4: General Recommendations for Plan/2030 Vision

This Plan has been developed and endorsed by the Androscoggin Transportation Resource Center (henceforth referred to as ATRC) in conjunction with members of staff from Lewiston, Auburn, Lewiston and Sabattus and various stakeholders. Its purpose is to provide information for bicycle and pedestrian facilities into the transportation plan for the ATRC region in 2030. What follows is are recommendations for the four E's of the Plan: Education, Encouragement, Engineering and Enforcement:

## I. *Education*

***Educate the public on the benefits of bicycling and walking for achieving community goals concerning transportation, environment, health care, economic development, education, tourism, and overall quality of life.***

A. ***Goal:*** *Build public consensus for bicycling and walking as an important public priority and personal ethic.*

- ❖ Institutionalize bicycling and walking as part of the goals, strategies, agendas, and activities of government and public and private agencies
- ❖ Employ a variety of media to educate residents and policymakers
- ❖ Quantify and market the health, environmental, and economic benefits of bicycling and walking
- ❖ Research and publicize success stories from other communities
- ❖ Generate a broad base of resources for implementation of the plan, including federal and state grants, local capital improvement dollars, impact fees, user fees, and public/private partnerships with businesses, schools, hospitals, and other institutions

B. ***Goal:*** *Engage area residents, schools, and businesses in the planning, implementation and maintenance of bicycle/pedestrian facilities.*

- ❖ Make presentations to local government, schools, businesses, and community groups
- ❖ Provide technical assistance to engage school and community groups as trail stewards
- ❖ Develop a unified mailing list of area advocates
- ❖ Enlist schools, businesses, neighborhoods, and public and private institutions in adopting and implementing strategies and projects outlined in the plan
- ❖ Celebrate the completion of new facilities

## II. *Encouragement*

***Encourage residents and visitors to bicycle and walk to meet their daily needs for transportation and recreation.***

A. ***Goal:*** *Increase public awareness of the location of bicycle and pedestrian facilities.*

- ❖ Develop a uniform identity through logo and signage
- ❖ Develop and distribute a regional map of the bicycling/walking network
- ❖ Develop and promote guided tours to increase residents' familiarity with facilities

B. ***Goal:*** *Increase consideration of walking and bicycling as convenient modes of transportation for short trips of two miles or less.*

- ❖ Encourage workplace policies that support alternative commuting
- ❖ Promote bicycling and walking as transportation to school
- ❖ Encourage wellness programs to incorporate bicycling and walking
- ❖ Encourage residents to bicycle and walk to community festivals
- ❖ Provide adequate bicycle parking in designated activity centers
- ❖ Accommodate bicycles on buses and trains

## III. *Engineering*

***Develop a seamless network of bicycle and pedestrian facilities that connects neighborhoods, downtowns, schools, parks, workplaces, shopping areas, and intermodal hubs within and between municipalities.***

A. ***Goal:*** *Plan, design, and build bicycle and pedestrian routes that are safe, direct, affordable, attractive, and accessible to residents of all ages and ability levels.*

- ❖ Provide sidewalks and bikeways on designated public rights-of-way appropriate to their street classification, traffic volume, width, and speed
- ❖ Provide multi-use pathways where improvements on public rights-of-way are not practicable
- ❖ Require consideration for sidewalks, paved shoulders, and bicycle parking in transportation projects and new residential and commercial development
- ❖ Adopt uniform engineering standards to guide the design and construction of facilities
- ❖ Inventory public rights-of-way to evaluate their potential for use as off-road trail facilities
- ❖ Monitor transportation projects in surrounding communities to ensure connectivity

B. ***Goal:*** *Integrate planning for bicycle and pedestrian facilities with transportation and land-use planning at the municipal and regional levels.*

- ❖ Revise local scoring criteria for federally-funded transportation projects
- ❖ Consider bicycle/pedestrian facilities in all transportation planning studies and at the design/engineering phase of all transportation projects
- ❖ Adopt land-use policies that enhance the physical environment for bicycling and walking (bicycle parking, access management, pedestrian amenities, and compact development)

## IV. Enforcement and Safety

***Create a safe environment for bicycling and walking that encourages lawful and responsible behavior which reduces the number and severity of injuries.***

A. ***Goal:*** *Encourage responsible and lawful behavior among pedestrians, bicyclists, motorists, and other residents.*

- ❖ Pinpoint and address high crash locations
- ❖ Update city ordinances related to the safety of bicyclists and pedestrians
- ❖ Deliver safety programs in schools

- ❖ Incorporate bicycle and pedestrian laws into driver education programs
- ❖ Reduce violence against bicyclists and pedestrians

B. ***Goal:*** *Implement physical changes that enhance the environment for walking and bicycling.*

- ❖ Address turning conflicts among pedestrians, bicyclists, and motor vehicles at designated intersections (crosswalks, pedestrian signals/leading pedestrian intervals, loop detectors, no right turn on red)
- ❖ Address site-specific barriers that discourage students from walking and bicycling to school (sidewalks, bicycle lanes, crosswalks)
- ❖ Develop a priority list of sidewalks, bikeways, and pathways for winter and spring maintenance
- ❖ Participate in MaineDOT's/Bicycle Coalition of Maine's Spot Me program

Additional recommendations at the end of this plan can be found for strategies to implement specific facilities, from spot treatments for challenging locations to funding sources. This Plan has a goal of providing tool and techniques to implement an array of bicycle and pedestrian facilities that satisfy the 2030 Vision.

What follows on the next two pages are two tables providing information on the agencies and departments best suited for implementing the goals and strategies contained in the Plan, as well as other agencies and community partners who may play a role in implementation of specific facilities.

## Goals, Strategies, and Responsibilities for Bicycle & Pedestrian Facilities

**Bikeways/Bike Routes:** Create bikeways on arterial and collector roads designated on 2030 Vision Maps

| Goal/Strategy | Responsibility |
|---|---|
| Stripe wide curb lanes as bike lanes as part of routine spring maintenance or road resurfacing projects | Public Works Department |
| Shift on-street parking to one side of the street to allow for provision of bicycle lanes | Planning Department/Community Services Department/Public Works/Public Services Departments |
| Pave shoulders as part of road reconstruction projects scheduled in the Biennial Transportation Improvement Program or local capital improvement programs | Public Works/Public Services Department/Maine Department of Transportation |
| Adopt policy to pave shoulders on all new or reconstructed state and local roads meeting MaineDOT/AASHTO criteria | Androscoggin Transportation Resource Center, City Councils/Boards of Selectmen |

**Pathways:** Develop an off-road network that completes street gaps, maximizes scenic assets, and creates neighborhood short cuts

| Goal/Strategy | Responsibility |
|---|---|
| Actively apply for private, state and federal resources, such as Transportation Enhancement grants, to build high priority projects | Androscoggin Transportation Resource Center, Planning and Public Works/Public Services Departments |
| Adopt land-use policies to support construction of pathways on 2025 Vision Map as part of new residential, institutional, and commercial development | Planning Departments and Planning Boards |
| Support efforts by schools, land trusts, and other community groups to map off-road rights-of-way and develop trails | Planning and Public Works/Public Services Departments, Androscoggin Transportation Resource Center |

**Sidewalks:** Construct sidewalks on both sides of arterials and collectors within the urban core

| Goal/Strategy | Responsibility |
|---|---|
| Complete short sidewalk gaps on arterial and collector roads | Public Works Departments |
| Include new and rehabilitated sidewalks as part of road reconstruction projects scheduled in the Biennial Transportation Improvement Program | Public Works/Public Services Departments and Maine Department of Transportation |
| Develop land-use policies to construct sidewalks and internal walkways as part of new residential, institutional, and commercial development | Planning Departments and Planning Boards |

**Intersections:** Ensure safe crossings of arterial and collector roads that reduces bicycle and pedestrian accidents

| Goal/Strategy | Responsibility |
|---|---|
| Address design problems at high crash locations | Public Works/Public Services Departments |
| Install and maintain visible crossings as part of road projects, new commercial developments, and junctions with off-road pathways | Public Works/Public Services Departments and Maine Department of Transportation |

**Pedestrian Districts:** Create streetscapes in dense, mixed-use districts that encourage bicycling and walking

| Goal/Strategy | Responsibility |
|---|---|
| Implement streetscape improvements as part of downtown revitalization, road reconstruction projects, and site review of new residential, institutional, and commercial development | Planning and Public Works/Public Services Departments, Planning Boards |
| Require bike racks during site review of parks, schools, parking garages, institutions, and new residential and commercial developments | Planning Departments and Planning Boards |
| Enact land-use policies that promote compact development | City Councils, Boards of Selectmen, Planning Departments, Planning Boards, Parks and Recreation |

## Resources for Biking and Walking Facilities

| Sources | Types of Projects | Examples |
|---|---|---|
| **Transportation projects**<br>• Road reconstruction<br>• Road resurfacing | Design and engineering; construction and rehabilitation of sidewalks; road widening and striping to create shoulders and bike lanes | Hotel Road, Auburn, Turner Street, Auburn, Route 9, Lisbon to Sabattus |
| **Land-use policies for new development**<br>• Ordinances re: subdivisions and streets<br>• Impact fees or exactions | Intersection improvements; construction of sidewalks, trails, and pathways; acquisition of open space | Require internal and external pedestrian access, such as sidewalks and walkways. Reduce parking standards to pay for pathways on 2030 Vision Map. Require open space in residential and commercial developments |
| **Transportation Enhancement Grants** | Feasibility studies; design, engineering, and construction, primarily of paved pathways | Grand Trunk Railroad pathway from Main Street to Washington Street, Auburn, Path from Payne Simard Park to Gas Light Park, Lewiston, Path from Paper Mill Trail to Downtown Lisbon Bates College Area Bike Loop, Lisbon Trail |
| **Community Development Block Grants** | Land acquisition; construction of sidewalks and pathways in depressed, urban areas | ELF Woods pathway, Auburn River Walk connection under Court Street |
| **Other state, federal, & foundation grants**<br>• Recreational Trails Program<br>• Brownfields<br>• Land & Water Conservation Fund<br>• Land for Maine's Future<br>• Maine Outdoor Heritage Fund | Land acquisition; trail planning, design, construction, and maintenance | Androscoggin Riverlands Mt. Apatite Union Street Gully Parkway |
| **Local Capital Improvement Program** | Construction and rehabilitation of sidewalks, primarily on local roads; striping of crosswalks, shoulders, and bike lanes | Matches for Enhancement grants Festival Plaza, Phase II Auburn |
| **Public/Private Partnerships**<br>• Service-learning in schools & colleges<br>• AmeriCorps<br>• Adopt-a-trail<br>• L/A Excels<br>• Androscoggin Land Trust/ LA Trails<br>• Healthy Androscoggin<br>• Bicycle Coalition of Maine<br>• Empower Lewiston | Land acquisition; trail planning, design, and construction<br>Trail amenities such as gateways, signage and benches<br>Trail stewardship and maintenance<br>Wellness promotion of bicycling and walking<br>Special event programming<br>Walking and bicycling tours<br>GPS mapping<br>Safety education | Sherwood Forest, Auburn<br>ELF Woods, Auburn/Franklin<br>Pasture, Lewiston<br>Thorncrag Bird Sanctuary<br>West Pitch Park<br>Payne Simard Park, Lewiston<br>Auburn Land Lab<br>Get Fit and Win |

# Chapter 5: Opinions of Cost and Funding Sources for Bicycle and Pedestrian Facilities

## *Costs for Bicycle and Pedestrian Facilities*

Gorrill-Palmer Consulting Engineers, Inc. prepared preliminary opinions of probable construction cost for various bicycle facilities for planning purposes. These opinions should not be considered a substitute for a full survey and design of engineering plans. In addition, the opinions do not include right-of-way acquisition, legal costs, potential wetland issues, utility improvements/relocation or other site-specific items that may affect costs.

The following table provides costs for various components of bicycle and pedestrian facilities. They are based on MaineDOT standard unit costs for 2008, a typical reference for opinions of cost for projects in Maine.

### Preliminary Opinions of Possible Construction Cost for Facilities

| Facility Type | Description | Unit cost (2008) | Cost/mile |
|---|---|---|---|
| **Sidewalks** | New, paved asphalt, five feet wide on both sides of road (includes the cost of granite curb and drainage) | $325 per linear ft | $1,720,000 |
| **Signage/ striping** | No widening, edge line striping plus two signs per mile on both sides of road | $7.30 per linear ft plus $200 per sign | $40,000 |
| **Rural Shoulder/ Bike Lane** | Roadway widening, five feet on both sides of road plus edge line striping | $125 per linear ft | $660,000 |
| **Urban Shoulder /Bike lane** | Roadway widening, five feet on both sides of road plus signage/striping (includes new drainage) | $370 per linear ft plus $200 per sign | $1,940,000 |
| **Multi-use pathway** | Paved asphalt, ten to twelve feet wide, including grading, drainage, landscaping. | $95 per linear ft | $510,000 |

## *Potential Funding for Bicycle and Pedestrian Facilities*

As with any potential transportation improvements, a number of funding possibilities exist for providing money for bicycle and pedestrian facilities. These range from the tried-and-tested (such as Federal Highway Funds) to the more experimental (allowing business districts to collect parking revenue and utilize it for transportation improvements within the district).

### *The Safe Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU)*

This wide-ranging transportation legislation was passed in August of 2005, for a five-year period. It covers many aspects of federally-funded transportation improvements, which have been broken into two major components as seen below:

*Biennial Transportation Improvement Plan (BTIP)*

Lewiston, Auburn, Lisbon and Sabattus work with ATRC to obtain state and federal money for the BTIP program, which allocates funds for specific transportation improvements on a two-year basis. These funds are for any type of transportation improvement, ranging from planning to roadway construction to mass transit. While this is a viable form of funding, money tends to be limited as it is disbursed among numerous municipalities and for many aspects of transportation.

This money is scattered among several sources, including the Congestion Mitigation and Air Quality Enhancement Program, Transportation Enhancement Activities, Safety Funding, National Highway System funds, Bridge funds, Interstate Maintenance, Federal Lands funds, Recreational Trails Program funds, National Scenic Byways funds, Congressionally-earmarked funds, etc.

*Safe Routes to School Program*

A key aspect of SAFETEA-LU differentiating it from previous federal transportation legislation was the Safe Routes to School Program (SF2S), which was begun in 2006. The goal of this program is to provide funding for walking and biking improvements for elementary and middle school-aged youth, as they are bused or driven to school in ever higher numbers, resulting in problems ranging from high transportation costs to traffic congestion to childhood obesity.

The funding must be for improvements within a two-mile radius of schools, which in the case of Lewiston, Auburn and Lisbon in particular results in coverage of much of the municipalities. The funding is not specific, in the sense that it can be utilized for anything from planning to design to construction of facilities.

Maine is to receive a total of five million dollars over five years as part of this program; it should be noted that even five million dollars for pedestrian and bicycle facilities, while useful, when spread throughout a state with several hundred municipalities competing for funds, results in small amounts of funding for a specific project.

Given the relatively small level of funding available, it is strongly recommended that Lewiston, Auburn, Lisbon, Sabattus and the other AVCOG communities work to secure SR2S funds for planning purposes. This money would allow for a public process and could provide communities with an opportunity to create a comprehensive plan, rather than a piecemeal approach which has frequently been the case.

***Community Development Block Grant Funds***

Administered through the Department of Housing and Urban Development (HUD), the Community Development Block Grant Program (CDBG) allows for funds to be disbursed to communities either directly from HUD or through states to accomplish various infrastructure or housing improvements. Communities receiving CDBG funds may use the funds for many kinds of community development activities including, but not limited to:

- Acquisition of property for public purposes
- Construction or reconstruction of streets, water and sewer facilities, neighborhood centers, recreation facilities, and other public works
- Demolition
- Rehabilitation of public and private buildings
- Public services
- Planning activities
- Assistance to nonprofit entities for community development activities
- Assistance to private, for profit entities to carry out economic development activities (including assistance to micro-enterprises).

The breadth of potential for projects using CDBG funds is wide enough to allow for bicycle and pedestrian improvements to be included, either through acquisition of property for new facilities, demolition of structures to allow for construction of facilities, or planning for new facilities. Lewiston and Auburn in particular have long utilized CDBG funds for downtown enhancement projects of all sorts.

### *Local Transportation Funds*

Each municipality has funds set aside each year for public works improvements, which can range from new roadways to sewer separation to lighting improvements. While municipalities have direct control over these funds, public works dollars tend to be a small amount of overall funding. A review of the Lewiston and Auburn budgets, both currently available, confirm this trend. For example, the Public Works budget for the City of Lewiston for FY 2008-2009 is 8.5 percent of overall City spending. Auburn, at approximately seven percent of overall spending, carries an even lower amount.

### *Other Funding Options*

Municipalities have begun exploring several other funding options. Again, given the limitations of state, federal and local general funds, communities in the ATRC region may wish to explore these options in addition to the general funding currently available.

*Tax Increment Financing Districts*

Tax increment financing districts (TIF Districts) are property-specific locations where a community works with the property owners to set aside property tax revenues for the purposes of specific infrastructure improvements. These funds remain with the municipality, which can bond for improvements and pay off the bonds with the tax revenues from the developments. This method is often utilized as an economic development tool, but does not have to be limited to improvements for utilities or motorized vehicles. Auburn, which has participated in TIF districts frequently, recently constructed the Auburn Mall Master Plan roadway and related improvements through the designation of a TIF district. These improvements included landscaping upgrades and the provision of sidewalks and bicycle lanes.

*Impact Fees*

Although not typically utilized in ATRC-area municipalities, impact fees have proven to be a useful funding tool for many Maine communities, including Portland, Old Orchard Beach, Brunswick and most notably, Scarborough. A municipality determines the cost of infrastructure improvements as well as a method of apportionment by projects that will benefit from said improvements as they enter the planning and approvals pipeline.

While most often utilized for utility or roadway improvements, the side benefits to these improvements can be new sidewalks or bicycle lanes. The advantage to this method of funding is fairness. Each new development enters the process paying only for its share of the improvements. As the improvements are ultimately made under the auspices of the municipality, it can also allow for regional improvements as opposed to spot improvements.

# Chapter 6: Implementation Recommendations

While the identification of different facilities and funding mechanisms may provide some options for Lewiston, Auburn, Lisbon and Sabattus, additional recommendations may be useful in implementing these facilities.

## *Connectivity: A Top Priority*

### *Population Centers*

In particular, the downtowns of the four communities have high population density and lower rates of automobile ownership. As such, it is important to provide facilities in these areas, as they have the greatest potential for use.

### *Between Facilities*

The most consistent comment that arose during the public process, both in discussions with stakeholders as well as members of the Committee, was that connectivity of facilities is paramount. Due to the constraints of funding of transportation improvements, items such as multi-use paths, bicycle lanes, paved shoulders and sidewalks all too often begin and terminate abruptly, often resulting in walkers and bicyclists suddenly being forced to share travel space with faster and larger motorized vehicles.

It is recommended for Lewiston, Auburn, Lisbon and Sabattus to identify gaps in facilities and make the closure of these facilities a top priority. The following examples illustrate certain key locations needing connections in each of the ATRC municipalities:

- Auburn: Connecting Riverwalk to the pathway fronting the Hilton Garden Hotel leading to West Pitch Fork Park by providing a connection underneath the Longley Bridge
- Lewiston: Connecting Payne Simard Park to Gas Light Park via bicycle lanes on Lincoln Street or a multi-use path along the Androscoggin River
- Lisbon: Connecting the Paper Mill and Ricker trails to downtown Lisbon via the Maine Central line along the Androscoggin River
- Sabattus: Providing bicycle connections as far as Lisbon along or near Route 9

### *Between Communities*

Connectivity is about more than simply providing access from one facility to another. In addition to smaller connections, the tenor of discussion during the public process related to the need to recognize that bicycling in particular is a viable means of transportation, and as such, should be reflected in facilities in the ATRC area. As the connections along Route 9 in Sabattus above indicate, it is important to provide bicycle access from one community to another. This is best done either along current arterials or dedicated right-of-way, such as alongside railroad lines. In the case of the former, a major route should have sufficient paved shoulders or bicycle lanes along with guidance signage. In the case of the latter, sufficient separation and barriers should be provided that satisfy basic safety concerns as well as those of the railroad, if it is an active freight or rail line.

### *East Coast Greenway*

The East Coast Greenway (ECG) is an organization whose goal is to ultimately provide an off-road bicycle-specific facility of the same name that is roughly comparable in length and connectivity to U.S. Route 1, from Key West, Florida to Calais, Maine. Currently, the goal is to provide a complete bicycle route along this corridor, transitioning to a separate pathway if and

when funds allow.
The mapping provides the intended on-road location for ECG through Lewiston and Lisbon. The route, as planned, would head north from Brunswick through Topsham to Lisbon and then Lewiston, where it would continue to Greene and eventually to Augusta. While the route is currently shown as being entirely on-road, it is recommended that any multi-use trails paralleling the current route be formally adopted as part of ECG, including Railroad Park in Lewiston and the Ricker and Paper Mill trails in Lisbon.

## *Ordinances and Comprehensive/Master Plans*

### *Local Ordinances/Site Development Process*

Each community can provide language within their ordinances that supports bicycling and walking, especially language that would allow for development of bicycle and pedestrian facilities within the site development review process. For example, if right-of-way does not currently allow for development of sidewalks or shoulders/bicycle lanes along a critical arterial or collector road, the Ordinance could require that a new site provide additional right-of-way to allow for development of such a facility. In addition, the Ordinance could require that employers encourage bicycle and pedestrian commuting with certain measures, discussed later in this section.

The Ordinances can also provide language about impact fees, TIF districts, parking districts and other aspects of funding that may allow for development of bicycle and pedestrian facilities. It is preferable to provide this language within a Town or City's Ordinance, as it allows project applicants for various projects to plan ahead for their requirements.

### *Comprehensive/Master Plans*

Lewiston, Auburn, Lisbon and Sabattus each have comprehensive plans that act as guides for the ongoing development of each respective community for a period of approximately ten years (the plans are updated once per decade, typically). The plans cover many aspects of community development, including transportation. Ideally, the comprehensive plans will either modify or adopt outright the recommendations contained in this Plan.

In addition, some communities, such as Lewiston and Auburn, adopt more detailed Master Plans for specific portions of their communities, such as New Auburn or the Lewiston/Auburn downtown area. Again, consistency between various plans will allow for a more effective push to allocate funding for construction and enhancement of pedestrian and bicycle facilities.

## *Transportation Demand Management Programs: Encouraging Travel by Bicycle and on Foot*

Another policy-based measure that communities can utilize for promoting the use of bicycles and pedestrians is the use of Transportation Demand Management (TDM) programs. Taking several different forms, TDM programs strive to reduce the volume of vehicular traffic on City and Town streets, typically through the use of alternate modes of travel or rideshare. These programs, therefore, can by used to provide additional incentives for traveling by bicycle and on foot.

Typically, the programs are a requirement of municipalities for employers to fulfill. In addition, the municipalities may take part in them. They typically consist of the provision of a

Transportation Coordinator who oversees the execution of the program and typically reviews it on an annual basis for efficacy.

The programs may encourage bicycle and pedestrian travel in a variety of ways. As an increasing number of employers are resorting to use of structured parking, particularly in downtown Lewiston and Auburn, costs for storage of vehicles has become significant. For each employee who does not travel by car, the potential for a parking space is removed. The City should encourage employers to examine costs for parking and determine if incentives can be provided to employees that will offset the costs. For example, an employer could do drawings once or twice a year for those employees not driving to work more than fifty percent of the time. The winner of the drawing would receive a new bicycle, courtesy of a local bicycle shop, or new walking shoes from a local shoe store. In addition, provisions at places of employment, such as showers, lockers, and secure storage areas for bicycles would further encourage employees.

It is important to note that travel by foot or bicycle constitutes regular exercise as well, and while this may be an obvious fact, if employers can prove to insurance companies that a good number of employees are fit due to regular exercise, it could have the additional benefit of reducing health insurance premiums. In addition, healthier employees are typically more productive, requiring fewer sick days.